

## 5th Grade Wandell School Science Curricula

Aligned to the Next Generation Science Standards (NGSS)

ENGAGING STUDENTS • FOSTERING ACHIEVEMENT • CULTIVATING 21<sup>ST</sup> CENTURY GLOBAL SKILLS

### Introduction

There is no doubt that science—and, therefore, science education—is central to the lives of all Americans. Never before has our world been so complex and science knowledge so critical to making sense of it all. When comprehending current events, choosing and using technology, or making informed decisions about one’s healthcare, science understanding is key. Science is also at the heart of the United States’ ability to continue to innovate, lead, and create the jobs of the future.

Through a collaborative, state-led process, new K–12 science standards have been developed that are rich in content and practice and arranged in a coherent manner across disciplines and grades to provide all students an internationally benchmarked science education. The Next Generation Science Standards are based on the Framework for K–12 Science Education developed by the National Research Council.

Every NGSS standard has three dimensions: disciplinary core ideas (content), scientific and engineering practices, and cross-cutting concepts.

The NGSS focus on a smaller set of Disciplinary Core Ideas (DCI) that students should know by the time they graduate from high school, focusing on deeper understanding and application of content. ← Science and engineering are integrated into science education by raising engineering design to the same level as scientific inquiry in science classroom instruction at all levels, and by emphasizing the core ideas of engineering design and technology applications

The NGSS content is focused on preparing students for college and careers. The NGSS are aligned, by grade level and cognitive demand with the English Language Arts and Mathematics Common Core State Standards. This allows an opportunity both for science to be a part of a child’s comprehensive education as well as ensuring an aligned sequence of learning in all content areas. The three sets of standards overlap and are reinforcing in meaningful and substantive ways.

Coupling practice with content gives the learning context, whereas practices alone are activities and content alone is memorization. It is through integration that science begins to make sense and allows students to apply the material.

### Gifted & Talented

The Saddle River School District extends learning opportunities to all high achieving students. It supports the philosophy that every student has special talents and gifts. The Saddle River School District’s enrichment and gifted & talented programs offer a unique approach to servicing all students while maintaining a focus on those who are identified as needing pull out services through the district’s screening/criteria process. The Saddle River School District’s enrichment program focuses on bringing out the special talents in all learners as enrichment instruction is delivered to all students in grades kindergarten through fifth grade. The program follows the Joseph Renzulli schoolwide enrichment model that concentrates on “schools being a place for talent development,” (Renzulli, 1994). The program follows a wide-range of enriching/developing activities based upon student strengths and interests. Additionally, the program focuses on enriching activities across the curriculum in providing complementary and developing features/standards for all subject areas. The enrichment program builds upon existing student learning standards in all content areas in coordination with instruction and student needs.

The Saddle River School District Gifted & Talented program offers pull-out instruction for those students meeting the multiple measures and specific criteria set forth and approved by the board of education. The identification process may/can begin as early as kindergarten. The gifted and talented program follows the central theme that all appropriate curriculum standards are followed and that those standards are the

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foundation for developing student learning opportunities and standards across the curriculum. The gifted and talented program will provide the following in coordination with each content area when and where appropriate:

- Develop students' abilities and engage critical thinking skills
- Expand students' creative thought process and responses
- Advance students' research skills needed to become independent learners
- Develop students' abilities to self-evaluate their own learning process
- Enrich students' abilities in seeking and expanding their own knowledge in subject content areas and individual talents
- Develop students' ability to interact effectively in small-group and large-group setting
- Heighten students' ability in expanding on student learning standards to strengthen appropriate skills necessary for 21st century learning

### English Language Learners (ELL)

The Saddle River School District recognizes the importance of increasing language proficiency while gaining confidence and strength so that academic goals and New Jersey state learning standards can be met. English Language Learners in the Saddle River School District are identified through a multitude of measures. These measure include, but are not limited to: a home language survey, parental conferencing, and daily teacher observations. Based on the information/data collected, the Saddle River School District will determine if a formal approved language assessment is necessary. The World-Class Instructional Design and Assessment (WIDA) is the assessment tool for those students recommended for ELL testing.

The Saddle River School District will provide the following accommodations for ELL students:

- Basic skills with a focus a the specific language skills
- Use of a translation dictionary (ipad, google translator, bilingual word to word dictionary)
- Preferential seating
- Extended time and/or modified classroom assignments
- Print out of teacher notes/lessons for additional review
- Extended time and/or modified assessments
- Extended time/accommodation for standardized testing in coordination with state regulations

### Special Education Students

The Saddle River School District special education department offers a full continuum of services for students who are eligible for special education services. In order to meet the specific requirements for each learner, programs are developed so that that social, emotional and educational needs are met within the least restrictive environment. The specific program for each learner is based on individual needs where goals and objectives are set and followed accordingly. These individual educational plans follow a specific plan that is aligned to the student learning standards and may include, but is/are not limited to:

- Individual education plan
- Pull-out support
- Replacement content instruction
- In-class support
- Instructional aide(s)
- Support services (i.e.; speech, physical therapy, occupational therapy)
- Presentation accommodations (i.e.; notes, outlines, instructions, lists, organization)
- Response accommodations (i.e.; dictations, audio, dictionaries, calculation devices, scribes)
- Setting accommodations (i.e.; lighting, acoustics, seat placement, testing, sensory tools)

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- Timing accommodations (i.e.; completing tasks, frequent breaks, processing directions)
- Scheduling accommodations (i.e.; spacing out projects/assignments, order of schedule)
- Organizational accommodations (i.e.; highlighter, time management, planning)
- Assignment modifications (i.e.; fewer tasks, alternate questions)
- Technology support (i.e; ipad, word processing, specific programs/apps)
- Testing accommodations (i.e.; extended time, placement, seating, time)

Students who require additional services outside of the district's resource program, may require an out-of-district placement. In this event, the Child Study Team will coordinate accordingly to ensure that all necessary learning standards are being met.

### **Students in Danger of Failing**

For those students in danger of failing, the Saddle River School District has a specific referral process to ensure that student needs are being met. The Intervention & Referral Services (I&RS) is an interdisciplinary team of professional within the school that addresses a full range of student/staff needs and concerns. This process is designed to maximize student success and establish goals and benchmarks to promote outcomes that positively reflect academics, health, behavior, self-esteem, work habits and strong character. The I&RS team is comprised of a chairperson, child study team member, teachers and other school professionals so that a continuous system of support can be provided. The team provides a plan so that short and long term goals can be established and strategies can be implemented and designed specifically for each student. In trying to achieve success, the team works collaboratively in making growth for each student a top priority and adhere to a plan that is achievable but rigorous. This plan, as set by New Jersey I&RS Team Process, may contain, but is not limited to the following;

- Request for assistance
- Information collection
- Parent Notification
- Problem solving within the I&RS team
- Developing an I&RS action plan
- Supporting, evaluating and continuing the process

In evaluating and monitoring students, the I&RS team closely calculates a plan so that curriculum needs can be met. In order to achieve and demonstrate success, the Saddle River School District provides modifications and support so that consideration is given to, but not limited to, the following:

- Student strengths/weaknesses
- Classroom and standardized assessments
- Academic records
- Social and behavioral patterns
- Previous history or concern
- Participation in class (and interaction with peers)
- Health related concerns
- Family concerns
- Retention of information/instruction
- Student interests
- Independent & group work habits
- Emotional status
- Study habits (at home/school)
- Present level of functioning
- Expectations (academic, social, behavioral, etc.)
- Following classroom rules/directions/procedures

As the I&RS team formulates a plan, many ongoing concerns are addressed within the team and may

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include parental notification/input. The problem solving objectives as set forth by New Jersey I&RS Team Process will:

- Describe the problem
- Identify the priority
- Develop objectives
- Review previous interventions
- Create new strategies
- Analyze and evaluate solutions

The Saddle River School District continues to inform and update staff of the I&RS procedures. The procedures are as follows:

- Teacher recognizes a problem(s) with a particular student in class and refers the student to the I&RS committee by filling out the appropriate paperwork. An I&RS meeting is scheduled to and the committee and appropriate staff members gather to discuss and begin the proactive process of assistance.
- Information from the teacher(s), administrator(s), and other school personnel is collected.
- Parent notification where/when appropriate
- The I&RS team begins the problem solving process by offering ideas and suggestions pertaining to the problems while prioritizing the most important issues.
- The I&RS team develops an action plan with specific strategies that can be implemented to achieve both short term and long term goals.
- The I&RS team meets regularly to evaluate and support the action plan (and to adjust accordingly when/where appropriate). Parents are notified on an ongoing basis to continue communication in the support of implementing the strategies set forth in the action plan.

Basic Skills Instruction is also a valuable resource that the Saddle River School District uses to meet the needs of struggling students. Students who require additional academic support will be offered that assistance in all subject areas. This system allows the students to receive in-class or pull-out support when and where appropriate so that grade level curriculum and student learning goals can be met. This program is an intervention system used to create a positive and constructive learning environment so that students can achieve success.

After the I&RS action plan has been in place the team may continue with the current strategies, offer/discuss new strategies or decide that the student should be referred to the district's child study team. In the instance of referring a student to the child study team, it can be concluded that many of the strategies from the action plan were not benefitting the student as intended. The child study team then would follow the guidelines for the referral process and notify the parents/guardians of the potential special education recommendation.

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### Unit A Overview

**Content Area: Science**

**Unit Title:** Unit A Science, Engineering, and Technology

**Target Course/Grade Level: 5**

#### Unit Background

Science is the study of the natural world to understand how it functions. Technology, on the other hand, changes or modifies the natural world to meet human needs or solve problems.

Advances in science contribute to advances in technology, which in turn can contribute to science. As scientists study the natural world, they do more than collect data. Their goal is to develop concepts that explain their observations. Sometimes these concepts become scientific theories, other times they become scientific laws.

A scientific theory is a well-tested scientific concept that explains a wide range of observations. An accepted theory has withstood repeated tests. If tests fail to support a theory, scientists change the theory or abandon it.

Unlike a theory, scientific law describes an observed pattern in nature, but does not provide an explanation for it. A scientific law is a statement that describes what scientists expect to happen every time under a particular set of circumstances.

In a well-designed scientific experiment, all variables must be the same except for one. A variable is any factor that can change in an experiment. The factor that is changed is referred to as the manipulated variable. The factor that changes as a result of the manipulated variable is called the responding variable and is what is measured or observed to obtain the experiment's results.

An experiment in which all factors except one are kept constant is a controlled experiment and includes a test called the control. Results of other tests are compared to the control.

**Primary interdisciplinary connections: Reading, Math, Social Studies, Language Arts, Writing, 21<sup>st</sup> century themes:**

- **Creativity and Innovation**
  - Think Creatively
  - Work Creatively with Others
  - Implement Innovations
- **Critical Thinking and Problem Solving**
  - Reason Effectively
  - Use Systems Thinking
  - Make Judgments and Decisions
  - Solve Problems
- **Communication and Collaboration**
  - Communicate Clearly
  - Collaborate with Others

#### Standard(s)

- **3-5-ETS1 Engineering Design**

#### Performance Expectations

- **3-5-ETS1-1 Define a simple design problem reflecting a need or a want that includes specified**

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<p><b>criteria for success and constraints on materials, time, or cost.</b></p> <ul style="list-style-type: none"> <li>● <b>3-5-ETS1-2 Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.</b></li> <li>● <b>3-5-ETS1-3 Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.</b></li> </ul>	
<p><b>Science and Engineering Practices</b></p> <p><b>Asking Questions and Defining Problems</b></p> <ul style="list-style-type: none"> <li>● Asking questions and defining problems in 3-5 builds on grades K-2 experiences and progresses to specifying qualitative relationships.</li> </ul> <p><b>Planning and Carrying Out Investigations</b></p> <ul style="list-style-type: none"> <li>● Planning and carrying out investigations to answer questions or test solutions to problems in 3-5 builds on K-2 experiences and progresses to include investigations that control variables and provide evidence to support explanations or design solutions.</li> </ul> <p><b>Constructing Explanations and Designing Solutions</b></p> <ul style="list-style-type: none"> <li>● Constructing explanations and designing solutions in 3-5 builds on K-2 experiences and progresses to the use of evidence in constructing explanation that specify variables that describe and predict phenomena and in designing multiple solutions to design problems.</li> </ul>	
<p><b>Disciplinary Core Ideas</b></p> <ul style="list-style-type: none"> <li>● <b>ETS1.A: Defining and Delimiting Engineering Problems</b></li> <li>● <b>ETS1.B: Developing Possible Solutions</b></li> <li>● <b>ETS1.C: Optimizing the Design Solution</b></li> </ul>	
<p><b>Crosscutting Concepts</b></p> <ul style="list-style-type: none"> <li>● <b>Influence of Science, Engineering, and Technology on Society and the Natural World</b></li> </ul>	
<b>Performance Expectations (PE)</b>	<b>Supporting Concepts, Practices, and Ideas</b>
3-5-ETS1-1	Define a simple design problem that can be solved through the development of an object, tool, process, or system and includes several criteria for success and constraints on materials, time, or cost.
	Possible solutions to a problem are limited by available materials and resources (constraints). The success of a designed solution is determined by considering the desired features of a solution (criteria). Different proposals for solutions can be compared on the basis of how well each one meets the specified criteria for success or how well each takes the constraints into account.
	People’s needs and wants change over time, as do their demands for new and improved technologies.
3-5-ETS1-2	Generate and compare multiple solutions to a problem based on how well they meet the criteria and constraints of the design problem.
	Research on a problem should be carried out before beginning to design a solution. Testing a solution involves investigating how well it performs under a range of likely conditions.
	At whatever stage, communicating with peers about proposed solutions is an important part of the design process, and shared ideas can lead to improved

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	designs.		
	Engineers improve existing technologies or develop new ones to increase their benefits, decrease known risks, and meet societal demands.		
3-5-ETS1-3	Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence, using fair tests in which variables are controlled and the number of trials considered.		
	Tests are often designed to identify failure points or difficulties, which suggest the elements of the design that need to be improved.		
	Different solutions need to be tested in order to determine which of them best solves the problem, given the criteria and the constraints.		
<b>Related Common Core ELA Standards</b>			
RI.5.1	Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text. (3-5-ETS1-2)		
RI.5.9	Integrate information from several texts on the same topic in order to write or speak about the subject knowledgeably. (3-5-ETS1-2)		
W.5.7	Conduct short research projects that use several sources to build knowledge through investigation of different aspects of a topic. (3-5-ETS1-1) (3-5-ETS1-3)		
W.5.8	Recall relevant information from experiences or gather relevant information from print and digital sources; summarize or paraphrase information in notes and finished work, and provide a list of sources. (3-5-ETS1-1) (3-5-ETS1-3)		
W.5.9	Draw evidence from literary or informational texts to support analysis, reflection, and research. (3-5-ETS1-1) (3-5-ETS1-3)		
<b>Related Common Core Mathematics Standards</b>			
MP.2	Reason abstractly and quantitatively. (3-5-ETS1-1) (3-5-ETS1-2) (3-5-ETS1-3)		
MP.4	Model with mathematics. (3-5-ETS1-1) (3-5-ETS1-2) (3-5-ETS1-3)		
MP.5	Use appropriate tools strategically. (3-5-ETS1-1) (3-5-ETS1-2) (3-5-ETS1-3)		
5.OA	Operations and Algebraic Thinking (3-5-ETS1-1) (3-5-ETS1-2)		
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; vertical-align: top;"> <p><b>Unit Essential Questions</b></p> <ul style="list-style-type: none"> <li>● <i>What do scientists do?</i></li> <li>● <i>How do scientists investigate?</i></li> <li>● <i>How do scientists collect and interpret data?</i></li> <li>● <i>How do scientists support their conclusions?</i></li> <li>● <i>What is technology?</i></li> <li>● <i>How does technology mimic living things?</i></li> <li>● <i>What is the design process?</i></li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <p><b>Unit Enduring Understandings</b></p> <ul style="list-style-type: none"> <li>● <b>Scientific inquiry involves asking scientifically oriented questions, collecting evidence, forming explanations, connecting explanations to scientific knowledge and theory, and communicating and justifying explanations.</b></li> <li>● <b>Safety first!</b></li> <li>● <b>Mathematics is a tool used to model objects, events, and relationships in the natural and designed world.</b></li> <li>● <b>The development of technology and advances in science are mutually supportive in driving innovation in both fields.</b></li> <li>● <b>Physical constraints and social values play a role in limiting the use of technology to solve problems.</b></li> </ul> </td> </tr> </table>		<p><b>Unit Essential Questions</b></p> <ul style="list-style-type: none"> <li>● <i>What do scientists do?</i></li> <li>● <i>How do scientists investigate?</i></li> <li>● <i>How do scientists collect and interpret data?</i></li> <li>● <i>How do scientists support their conclusions?</i></li> <li>● <i>What is technology?</i></li> <li>● <i>How does technology mimic living things?</i></li> <li>● <i>What is the design process?</i></li> </ul>	<p><b>Unit Enduring Understandings</b></p> <ul style="list-style-type: none"> <li>● <b>Scientific inquiry involves asking scientifically oriented questions, collecting evidence, forming explanations, connecting explanations to scientific knowledge and theory, and communicating and justifying explanations.</b></li> <li>● <b>Safety first!</b></li> <li>● <b>Mathematics is a tool used to model objects, events, and relationships in the natural and designed world.</b></li> <li>● <b>The development of technology and advances in science are mutually supportive in driving innovation in both fields.</b></li> <li>● <b>Physical constraints and social values play a role in limiting the use of technology to solve problems.</b></li> </ul>
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	<ul style="list-style-type: none"> <li>● <b>Thinking systematically means looking for the relationships between parts.</b></li> </ul>
<p><b>Unit Learning Targets</b>  <i>Students will be Able To:</i></p> <ul style="list-style-type: none"> <li>● describe how scientists use inquiry to learn about the world around them</li> <li>● explain how scientists investigate problems in many different ways</li> <li>● explain how scientists collect and interpret data using many different kinds of tools in a safe way</li> <li>● describe how scientists draw conclusions and support them using evidence</li> <li>● describe how technology solve problems and provides solutions</li> <li>● explain how some technology can mimic the muscular and skeletal systems</li> <li>● explain how to use the design process</li> </ul>	
<p><b>Unit Vocabulary:</b></p> <ul style="list-style-type: none"> <li>● <b>Chapter 1:</b> <i>accuracy, control group, data, evidence, experiment, hypothesis, inference, observation, precision, procedures, variable</i></li> <li>● <b>Chapter 2:</b> <i>design process, microchip, technology, prototype, prosthetic limb</i></li> </ul>	
<b>Evidence of Learning</b>	
<p><b>Summative Assessments at the end of each chapter.</b>  <b>Equipment needed:</b> See teacher’s edition  <b>Teacher Resources:</b> Pearson Interactive Science  <a href="https://www.pearsonsuccessnet.com/snpapp/login/PsnLandingPage.jsp?showLandingPage=true&amp;ticket=ST-1368125-E9Ki92wc0g5CVII9xxk5-b3-rumba-prod-01-01">https://www.pearsonsuccessnet.com/snpapp/login/PsnLandingPage.jsp?showLandingPage=true&amp;ticket=ST-1368125-E9Ki92wc0g5CVII9xxk5-b3-rumba-prod-01-01</a></p>	

<p><b>Formative Assessments</b></p> <ul style="list-style-type: none"> <li>● teacher observation</li> <li>● student responses to questions</li> <li>● student participation in inquiry activities</li> <li>● student interactive science journal</li> <li>●</li> <li>●</li> </ul>	
<b>Lesson Plans</b>	
<b>Chapter 1: <i>The Nature of Science</i></b>	<b>Timeframe</b>
Lesson 1 <i>What Do Scientists Do?</i>	<b>3-4 class periods</b>
Lesson 2 <i>How Do Scientists Investigate?</i>	<b>3-4 class periods</b>
Lesson 3 <i>How Do Scientists Collect and Interpret Data?</i>	<b>3-4 class periods</b>
Lesson 4 <i>How Do Scientists Support Their Conclusions?</i>	<b>3-4 class periods</b>
<p><b>Inquiry Questions and Labs:</b></p> <ul style="list-style-type: none"> <li>● <i>What questions do scientists ask?</i></li> <li>● <i>How does a banana slice change over time?</i></li> <li>● <i>What substance can help preserve a banana slice?</i></li> <li>● <b>Go Green: A Bright Invention</b></li> </ul>	



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- *What method keeps bread freshest?*
- **At-Home Lab: Falling Water**
- *Why do scientists use thermometers?*
- **Lightning Lab: Estimate and Measure**
- *Which towel absorbs the most water?*
- **Lightning Lab: Coin Flip**

<b>Chapter 2: Design and Function</b>	<b>Timeframe</b>
Lesson 1 <i>What is Technology?</i>	<b>3-4 class periods</b>
Lesson 2 <i>How Does Technology Mimic Living Things?</i>	<b>3-4 class periods</b>
Lesson 3 <i>What is the Design Process?</i>	<b>3-4 class periods</b>
<b>Inquiry Questions and Labs:</b> <ul style="list-style-type: none"> <li>● <i>How can you design a strong glue?</i></li> <li>● <i>How can you make and redesign a model of a robotic arm?</i></li> <li>● <i>How can you redesign the robotic arm to pick up heavier objects?</i></li> <li>● <i>Which transport system works best?</i></li> <li>● <b>At-Home Lab: Design Solutions</b></li> <li>● <b>At-Home Lab: Technology Walk</b></li> <li>● <i>How can the design of a model arm help you learn about how your arm works?</i></li> <li>● <b>Go Green: Green Design</b></li> </ul>	
<b>Teacher Notes:</b>	
<b>Curriculum Development Resources</b> Click the links below to access additional resources used to design this unit: <ul style="list-style-type: none"> <li>● <b>Next Generation Science Standards (NGSS)</b> <a href="http://www.nextgenscience.org/">http://www.nextgenscience.org/</a></li> <li>● <b>21<sup>st</sup> Century Skills</b> <a href="http://www.p21.org/our-work/p21-framework">http://www.p21.org/our-work/p21-framework</a></li> <li>● <b>New Jersey Standards Clarification Project</b> <a href="http://www.nj.gov/education/aps/njscp/Phase1allAreas.pdf">http://www.nj.gov/education/aps/njscp/Phase1allAreas.pdf</a></li> </ul>	

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The Nature of Science: Lesson 1							
<b>Content Area: Science</b>							
<b>Lesson Title:</b> <i>What Do Scientists Do?</i>				<b>Timeframe:</b> 3-4 class periods			
Lesson Components [Each * Item is Optional, and "As Needed"]							
<b><u>*21<sup>st</sup> Century Themes</u></b>							
	Global Awareness		Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy		Health Literacy
<b><u>*21<sup>st</sup> Century Skills</u></b>							
x	Creativity and Innovation	x	Critical Thinking and Problem Solving	x	Communication and Collaboration		Information Literacy
	Media Literacy		ICT Literacy	x	Life and Career Skills		
<b>*Interdisciplinary Connections: see unit overview</b>							
<b>*Integration of Technology: Pearson Interactive Science Program</b>							
<b>*Equipment needed: see teacher's edition</b>							
<b>*Vocabulary: see unit overview for all vocabulary associated with this unit</b>							

Learning Outcomes	Learning Activities/Instructional Strategies
<p>Students Will Be Able To:</p> <ul style="list-style-type: none"> <li>● describe how scientists use inquiry to learn about the world around them</li> </ul>	<p><b>Lesson Sequence</b></p> <ol style="list-style-type: none"> <li>1. <b>Engage:</b> <ol style="list-style-type: none"> <li>a. Students discuss what they think the scientist is learning about the ocean.</li> <li>b. Introduce lesson vocabulary.</li> </ol> </li> <li>2. <b>Explore: My Planet Diary Fun Fact</b></li> <li>3. <b>Explain:</b> <ol style="list-style-type: none"> <li>a. Review lesson question.</li> <li>b. Students read <i>Problems, Decisions, and New Ideas; Scientific Research and Knowledge; Predict and Make Hypotheses; Make Observations; and Draw Conclusions</i> then answer questions using reading strategies.</li> </ol> </li> <li>4. <b>Go Green: A Bright Invention</b> <ol style="list-style-type: none"> <li>a. Students think about their community, define a problem that affects it, and find a solution to the problem.</li> </ol> </li> <li>5. <b>Elaborate:</b></li> </ol>

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	<p>a. <b>Science Notebook:</b> Students use the internet to find a scientific journal article about marine life, and write the reference information for the article in their Science Notebook.</p> <p>6. <b>Evaluate:</b></p> <p>a. Review lesson vocabulary</p> <p>b. Students complete the Lesson Check blackline master to determine whether they need additional help with lesson content.</p>
<p><b>Differentiation:</b> Embedded in the program are</p> <ul style="list-style-type: none"> <li>• strategies for English Language Learners</li> <li>• leveled readers</li> <li>• resources to address multiple intelligences</li> </ul>	
<p><b>Resources Provided:</b> <i>Pearson Interactive Science</i></p>	

<b>The Nature of Science: Lesson 2</b>							
<b>Content Area: Science</b>							
<b>Lesson Title:</b> <i>How Do Scientists Investigate?</i>				<b>Timeframe:</b> 3-4 class periods			
<b>Lesson Components [Each * Item is Optional, and "As Needed"]</b>							
<b><u>*21<sup>st</sup> Century Themes</u></b>							
	Global Awareness		Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy		Health Literacy
<b><u>*21<sup>st</sup> Century Skills</u></b>							
x	Creativity and Innovation	x	Critical Thinking and Problem Solving	x	Communication and Collaboration		Information Literacy
	Media Literacy		ICT Literacy	x	Life and Career Skills		
<b>*Interdisciplinary Connections: see unit overview</b>							
<b>*Integration of Technology: Pearson Interactive Science Program</b>							
<b>*Equipment needed: see teacher's edition</b>							
<b>*Vocabulary: see unit overview for all vocabulary associated with this unit</b>							

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Learning Outcomes	Learning Activities/Instructional Strategies
<p>Students Will Be Able To:</p> <ul style="list-style-type: none"><li>● explain how scientists investigate problems in many different ways</li></ul>	<p><b>Lesson Sequence</b></p> <ol style="list-style-type: none"><li>1. <b>Engage:</b><ol style="list-style-type: none"><li>a. Students discuss how they think scientists use a wind tunnel to build safer cars.</li><li>b. Introduce lesson vocabulary.</li></ol></li><li>2. <b>Explore It! <i>Which method keeps bread freshest?</i></b></li><li>3. <b>Explain:</b><ol style="list-style-type: none"><li>a. Review lesson question.</li><li>b. Students read <i>Scientific Investigation, Models, Surveys and Sampling, Steps for Investigation, and Document Procedures</i> then answer questions using reading strategies.</li></ol></li><li>4. <b>At-Home Lab: <i>Falling Water</i></b><ol style="list-style-type: none"><li>a. Students make holes in a cup to experiment with water pressure.</li></ol></li><li>5. <b>Elaborate:</b><ol style="list-style-type: none"><li>a. <b>Science Notebook:</b> Students draw a diagram showing how toothpicks and marshmallows might be used to make a model bridge.</li></ol></li><li>6. <b>Evaluate:</b><ol style="list-style-type: none"><li>a. Review lesson vocabulary</li><li>c. Students complete the Lesson Check blackline master to determine whether they need additional help with lesson content.</li></ol></li></ol>
<p><b>Differentiation:</b></p> <p>Embedded in the program are</p> <ul style="list-style-type: none"><li>● strategies for English Language Learners</li><li>● leveled readers</li><li>● resources to address multiple intelligences</li></ul>	
<p><b>Resources Provided:</b> <i>Pearson Interactive Science</i></p>	

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The Nature of Science: Lesson 3				
<b>Content Area: Science</b>				
<b>Lesson Title:</b> <i>How Do Scientists Collect and Interpret Data?</i>			<b>Timeframe:</b> 3-4 class periods	
Lesson Components [Each * Item is Optional, and "As Needed"]				
<b><u>*21<sup>st</sup> Century Themes</u></b>				
	Global Awareness		Financial, Economic, Business, and Entrepreneurial Literacy	
			Civic Literacy	Health Literacy
<b><u>*21<sup>st</sup> Century Skills</u></b>				
x	Creativity and Innovation	x	Critical Thinking and Problem Solving	x
			Communication and Collaboration	Information Literacy
	Media Literacy		ICT Literacy	x
			Life and Career Skills	
<b>*Interdisciplinary Connections: see unit overview</b>				
<b>*Integration of Technology: Pearson Interactive Science Program</b>				
<b>*Equipment needed: see teacher's edition</b>				
<b>*Vocabulary: see unit overview for all vocabulary associated with this unit</b>				

Learning Outcomes	Learning Activities/Instructional Strategies
Students Will Be Able To: <ul style="list-style-type: none"> <li>● explain how scientists collect and interpret data using many different kinds of tools in a safe way</li> </ul>	<b>Lesson Sequence</b> <ol style="list-style-type: none"> <li>1. <b>Engage:</b> <ol style="list-style-type: none"> <li>a. Students discuss how scientists studying strong storms could help people stay safe.</li> <li>b. Introduce lesson vocabulary.</li> </ol> </li> <li>2. <b>Explore It! <i>Why do scientists use thermometers?</i></b></li> <li>3. <b>Explain:</b> <ol style="list-style-type: none"> <li>a. Review lesson question.</li> <li>b. Students read <i>Data Collecting, Precision and Accuracy, Tools, Safety, Organize Data, Interpret Data,</i> and <i>Make Inferences</i> then answer questions using reading strategies.</li> </ol> </li> <li>4. <b>Lightning Lab: <i>Estimate and Measure</i></b> <ol style="list-style-type: none"> <li>a. Students estimate the length, width, or height of classroom objects and compare estimates with actual measurements.</li> </ol> </li> </ol>

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	<p>5. <b>Elaborate:</b></p> <p style="padding-left: 20px;">a. <b>Science Notebook:</b> Students choose a tool from the Student Edition page and describe the tool and how they would use it in their Science Notebook.</p> <p>6. <b>Evaluate:</b></p> <p style="padding-left: 20px;">a. Review lesson vocabulary</p> <p style="padding-left: 20px;">b. Students complete the Lesson Check blackline master to determine whether they need additional help with lesson content.</p>
<p><b>Differentiation:</b> Embedded in the program are</p> <ul style="list-style-type: none"> <li>● strategies for English Language Learners</li> <li>● leveled readers</li> <li>● resources to address multiple intelligences</li> </ul>	
<p><b>Resources Provided:</b> <i>Pearson Interactive Science</i></p>	

<b>The Nature of Science: Lesson 4</b>							
<b>Content Area: Science</b>							
<b>Lesson Title:</b> <i>How Do Scientists Support Their Conclusions?</i>				<b>Timeframe:</b> 3-4 class periods			
<b>Lesson Components [Each * Item is Optional, and "As Needed"]</b>							
<b><u>*21<sup>st</sup> Century Themes</u></b>							
	Global Awareness		Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy		Health Literacy
<b><u>*21<sup>st</sup> Century Skills</u></b>							
x	Creativity and Innovation	x	Critical Thinking and Problem Solving	x	Communication and Collaboration		Information Literacy
	Media Literacy		ICT Literacy	x	Life and Career Skills		

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<b>*Interdisciplinary Connections:</b> see unit overview
<b>*Integration of Technology:</b> Pearson Interactive Science Program
<b>*Equipment needed:</b> see teacher's edition
<b>*Vocabulary:</b> see unit overview for all vocabulary associated with this unit

Learning Outcomes	Learning Activities/Instructional Strategies
<p>Students Will Be Able To:</p> <ul style="list-style-type: none"> <li>● describe how scientists draw conclusions and support them using evidence</li> </ul>	<p><b>Lesson Sequence</b></p> <ol style="list-style-type: none"> <li>1. <b>Engage:</b> <ol style="list-style-type: none"> <li>a. Students discuss what they can conclude based on observations about some birds' beaks.</li> <li>b. Introduce lesson vocabulary.</li> </ol> </li> <li>2. <b>Explore It! <i>Which towel absorbs the most water?</i></b></li> <li>3. <b>Explain:</b> <ol style="list-style-type: none"> <li>a. Review lesson question.</li> <li>b. Students read <i>Draw and Defend Conclusions, Evidence,</i> and <i>Review and Retest</i> then answer questions using reading strategies.</li> </ol> </li> <li>4. <b>Lightning Lab: <i>Coin Flip</i></b> <ol style="list-style-type: none"> <li>a. Students flip a coin ten times and record how many times heads comes up.</li> </ol> </li> <li>5. <b>Elaborate:</b> <ol style="list-style-type: none"> <li>a. <b>Science Notebook:</b> Students write one fact and one opinion related to a particular topic in their Science Notebook.</li> </ol> </li> <li>6. <b>Evaluate:</b> <ol style="list-style-type: none"> <li>a. Review lesson vocabulary</li> <li>b. Students complete the Lesson Check blackline master to determine whether they need additional help with lesson content.</li> </ol> </li> </ol>
<p><b>Differentiation:</b></p> <p>Embedded in the program are</p> <ul style="list-style-type: none"> <li>● strategies for English Language Learners</li> <li>● leveled readers</li> <li>● resources to address multiple intelligences</li> </ul>	
<p><b>Resources Provided:</b> <i>Pearson Interactive Science</i></p>	

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Design and Function: Lesson 1							
<b>Content Area: Science</b>							
<b>Lesson Title:</b> <i>What is Technology?</i>				<b>Timeframe:</b> 3-4 class periods			
Lesson Components [Each * Item is Optional, and "As Needed"]							
* <u>21<sup>st</sup> Century Themes</u>							
	Global Awareness		Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy		Health Literacy
* <u>21<sup>st</sup> Century Skills</u>							
x	Creativity and Innovation	x	Critical Thinking and Problem Solving	x	Communication and Collaboration		Information Literacy
	Media Literacy		ICT Literacy	x	Life and Career Skills		
<b>*Interdisciplinary Connections: see unit overview</b>							
<b>*Integration of Technology: Pearson Interactive Science Program</b>							
<b>*Equipment needed: see teacher's edition</b>							
<b>*Vocabulary: see unit overview for all vocabulary associated with this unit</b>							

Learning Outcomes	Learning Activities/Instructional Strategies
Students Will Be Able To: <ul style="list-style-type: none"> <li>● describe how technology solves problems and provided solutions</li> </ul>	<b>Lesson Sequence</b> <ol style="list-style-type: none"> <li>1. <b>Engage:</b> <ol style="list-style-type: none"> <li>a. Students discuss what problems they think doctors might solve using the image.</li> <li>b. Introduce lesson vocabulary.</li> </ol> </li> <li>2. <b>Explore It! <i>Which transport system works best?</i></b></li> <li>3. <b>Explain:</b> <ol style="list-style-type: none"> <li>a. Review lesson question.</li> <li>b. Students read <i>Problems and Solutions, Tools in Medicine</i>, and <i>Computer Technology</i> then answer questions using reading strategies.</li> </ol> </li> <li>4. <b>At-Home Lab: <i>Design Solutions</i></b> <ol style="list-style-type: none"> <li>a. Students use pictures they have cut out and</li> </ol> </li> </ol>



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	<p>written about to create a poster about helpful technologies.</p> <p>5. <b>Elaborate:</b></p> <p style="padding-left: 20px;">a. <b>Science Notebook:</b> Students find information about some problems the World Wide Web has caused.</p> <p>6. <b>Evaluate:</b></p> <p style="padding-left: 20px;">a. Review lesson vocabulary</p> <p style="padding-left: 20px;">b. Students complete the Lesson Check blackline master to determine whether they need additional help with lesson content.</p>
<p><b>Differentiation:</b></p> <p>Embedded in the program are</p> <ul style="list-style-type: none"> <li>• strategies for English Language Learners</li> <li>• leveled readers</li> <li>• resources to address multiple intelligences</li> </ul>	
<p><b>Resources Provided:</b> <i>Pearson Interactive Science</i></p>	

<b>Design and Function: Lesson 2</b>						
<b>Content Area: Science</b>						
<b>Lesson Title:</b> <i>How Does Technology Mimic Living Things?</i>				<b>Timeframe:</b> 3-4 class periods		
<b>Lesson Components [Each * Item is Optional, and "As Needed"]</b>						
<b><u>*21<sup>st</sup> Century Themes</u></b>						
	Global Awareness		Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy	Health Literacy
<b><u>*21<sup>st</sup> Century Skills</u></b>						
x	Creativity and Innovation	x	Critical Thinking and Problem Solving	x	Communication and Collaboration	Information Literacy
	Media Literacy		ICT Literacy	x	Life and Career Skills	
<b>*Interdisciplinary Connections: see unit overview</b>						

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**\*Integration of Technology:** Pearson Interactive Science Program

**\*Equipment needed:** see teacher's edition

**\*Vocabulary:** see unit overview for all vocabulary associated with this unit

Learning Outcomes	Learning Activities/Instructional Strategies
<p>Students Will Be Able To:</p> <ul style="list-style-type: none"> <li>● explain how some technology can mimic the muscular and skeletal systems</li> </ul>	<p><b>Lesson Sequence</b></p> <ol style="list-style-type: none"> <li>1. <b>Engage:</b> <ol style="list-style-type: none"> <li>a. Students discuss how a hand-held device could help someone speak.</li> <li>b. Introduce lesson vocabulary.</li> </ol> </li> <li>2. <b>Explore: My Planet Diary <i>Did You Know?</i></b></li> <li>3. <b>Explain:</b> <ol style="list-style-type: none"> <li>a. Review lesson question.</li> <li>b. Students read <i>Technology and the Human Body, Prosthetic Limbs, Animals and Technology</i>, and <i>Nanobots</i> then answer questions using reading strategies.</li> </ol> </li> <li>4. <b>At-Home Lab: <i>Technology Walk</i></b> <ol style="list-style-type: none"> <li>a. Students make holes in a cup to experiment with water pressure.</li> </ol> </li> <li>5. <b>Elaborate:</b> <ol style="list-style-type: none"> <li>a. <b>Science Notebook:</b> Students draw a picture of prosthesis for a limb (e.g., arm, leg, hand, finger, or toe) in their Science Notebook.</li> </ol> </li> <li>6. <b>Evaluate:</b> <ol style="list-style-type: none"> <li>a. Review lesson vocabulary</li> <li>b. Students complete the Lesson Check blackline master to determine whether they need additional help with lesson content.</li> </ol> </li> </ol>
<p><b>Differentiation:</b></p> <p>Embedded in the program are</p> <ul style="list-style-type: none"> <li>● strategies for English Language Learners</li> <li>● leveled readers</li> <li>● resources to address multiple intelligences</li> </ul>	
<p><b>Resources Provided:</b> <i>Pearson Interactive Science</i></p>	

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Design and Function: Lesson 3					
<b>Content Area: Science</b>					
<b>Lesson Title:</b> <i>What is the Design Process?</i>				<b>Timeframe:</b> 3-4 class periods	
Lesson Components [Each * Item is Optional, and "As Needed"]					
<u>*21<sup>st</sup> Century Themes</u>					
	Global Awareness		Financial, Economic, Business, and Entrepreneurial Literacy	Civic Literacy	Health Literacy
<u>*21<sup>st</sup> Century Skills</u>					
x	Creativity and Innovation	x	Critical Thinking and Problem Solving	x	Communication and Collaboration
	Media Literacy		ICT Literacy	x	Life and Career Skills
<b>*Interdisciplinary Connections: see unit overview</b>					
<b>*Integration of Technology: Pearson Interactive Science Program</b>					
<b>*Equipment needed: see teacher's edition</b>					
<b>*Vocabulary: see unit overview for all vocabulary associated with this unit</b>					

Learning Outcomes	Learning Activities/Instructional Strategies
Students Will Be Able To: <ul style="list-style-type: none"> <li>● explain how to use the design process</li> </ul>	<b>Lesson Sequence</b> <ol style="list-style-type: none"> <li>1. <b>Engage:</b> <ol style="list-style-type: none"> <li>a. Students discuss how people design new technologies.</li> <li>b. Introduce lesson vocabulary.</li> </ol> </li> <li>2. <b>Explore It! <i>How can the design of a model arm help you learn about how your arm works?</i></b></li> <li>3. <b>Explain:</b> <ol style="list-style-type: none"> <li>a. Review lesson question.</li> <li>b. Students read <i>Design Process</i>, <i>Steps of the Design Process</i>, and <i>Designing Robotic Arms</i> then answer questions using reading strategies.</li> </ol> </li> </ol>

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	<ol style="list-style-type: none"><li>4. <b>Go Green: <i>Green Design</i></b><ol style="list-style-type: none"><li>a. Students think of a problem related to conservation of resources and make a plan to design a solution.</li></ol></li><li>5. <b>Elaborate:</b><ol style="list-style-type: none"><li>a. <b>Science Notebook:</b> Students apply the steps in the design process to a problem at school in their Science Notebook.</li></ol></li><li>6. <b>Evaluate:</b><ol style="list-style-type: none"><li>a. Review lesson vocabulary</li><li>b. Students complete the Lesson Check blackline master to determine whether they need additional help with lesson content.</li></ol></li></ol>
<p><b>Differentiation:</b> Embedded in the program are</p> <ul style="list-style-type: none"><li>• strategies for English Language Learners</li><li>• leveled readers</li><li>• resources to address multiple intelligences</li></ul>	
<p><b>Resources Provided:</b> <i>Pearson Interactive Science</i></p>	

### Unit B Overview

**Content Area:** Science

**Unit Title:** Unit B Life Science: *Classifying Organisms, Growth and Survival, Structure and Function, and Ecosystems*

**Target Course/Grade Level:** 5

#### Unit Background

Mammals are classified in three groups based on how their young develop: monotremes (egg layers); marsupials (animals with pouches to protect their young as they develop); and placental mammals (offspring develop in the mother's body until their own body systems can function independently).

The bodies of complex animals have either bilateral symmetry or radial symmetry. Bilateral symmetry allows for a streamlined balanced body. The sense organs are located on the animal's front end so they can pick up information about what is ahead of them.

The external body parts of animals with radial symmetry are equally spaced around a central point. All animals with radial symmetry live in water, such as jellyfish, sea anemones, and sea urchins. These animals learn about their environment through the senses of touch and taste which function on the surface of their bodies and allow these animals to sense food coming from any direction.

Plants reproduce by spreading their seeds via animals, wind, water, or the ability to "shoot" out their seeds. For example, the seedpods of wisteria and impatiens plants burst suddenly with a force that scatters the seeds away

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from the pods in many directions.

Plants grow and survive by responding to stimuli, this response is known as a tropism. Plants exhibit thigmotropism, a response to touch, such as when a plant wraps its tendrils around a fence post. They also exhibit phototropism, a response to light by turning their leaves towards the light source. Another tropic response is gravitropism, a response to gravity. This response ensures that the roots of the plant always burrow in the ground and the plants leaves always face the sun.

When some animals hatch or are born, they recognize and follow the first moving object they see. This behavior, a combination of instinct and learned behavior, is known as imprinting. Usually the first moving object a newborn animal will see is its mother, however, imprinting may occur on people, moving toys, and other kinds of animals. Once imprinting has taken place, it cannot be changed. Imprinting has two uses. The young animals stay close to their mothers that know where to find food and how to avoid predators. Imprinting also allows young animals to learn what animals of their kind look like. This knowledge will help later on when they are searching for a mate.

The human body is a collection of systems that work together: the circulatory system with its heart and blood vessels provide every cell with nutrients and waste removal; the respiratory system – the nose, trachea, and lungs brings oxygen into the body and discards the waste gas carbon dioxide. The brain sends signals to all parts of the body and keeps us alive and moving. The skeletal system protects the internal organs and gives the body structure.

Animals and plants coexist in ways that help each other or benefit only one type of organism. A symbiotic relationship benefits both partners such as the red-billed oxpecker bird and a giraffe. The bird climbs on the giraffe and feeds on ticks. The bird gets a meal, and the giraffe avoids tick infestations. Commensalism is a relationship in which one party benefits, but the other is neither helped nor harmed. Parasites, however, are organisms that benefit from living on, or inside an organism, but the host organism is harmed by the presence of the parasite.

Animal species become extinct because of habitat destruction and habitat fragmentation. Land that is cleared for development destroys habitats and changes an ecosystem; some species are not able to survive these changes. Habitat fragmentation occurs when habitats are broken into small isolated pieces such as when a road is built. Poaching, pollution, and the introduction of an exotic species into an ecosystem can also lead to extinction.

**Primary interdisciplinary connections: Reading, Math, Social Studies, Language Arts, Writing,**

**21<sup>st</sup> century themes:**

- **Creativity and Innovation**
  - Think Creatively
  - Work Creatively with Others
  - Implement Innovations
- **Critical Thinking and Problem Solving**
  - Reason Effectively
  - Use Systems Thinking
  - Make Judgments and Decisions
  - Solve Problems
- **Communication and Collaboration**
  - Communicate Clearly
  - Collaborate with Others

**Standard(s)**

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- 5-PS3 Energy
- 5-LS1 From Molecules to Organisms: Structures and Processes
- 5-LS2 Ecosystems: Interactions, Energy, and Dynamics
- 4-LS1 From Molecules to Organisms: Structures and Processes
- 3-LS4 Biological Evolution: Unity and Diversity
- 

### Performance Expectations

- 5-PS3-1 Use models to describe that energy in animals' food (used for body repair, growth, motion, and to maintain body warmth) was once energy from the sun.
- 5-LS1-1 Support an argument that plants get the materials they need for growth chiefly from air and water.
- 5-LS2-1 Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.
- 4-LS1-1 Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.
- 4-LS1-2 Use a model to describe that animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways.
- 3-LS4-3 Construct an argument with evidence that in a particular habitat some organisms survive well, some less well, and some cannot survive at all.
- 3-LS4-4 Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there change.

### Science and Engineering Practices

#### Developing and Using Models

- Modeling in 3-5 builds on K-2 experiences and progresses to building and revising simple models and using models to represent events and design solutions.

#### Engaging in Argument from Evidence

- Engaging in argument from evidence in 3-5 builds on K-2 experiences and progresses to critiquing the scientific explanations or solutions proposed by peers by citing relevant evidence about the natural and designed world(s).

#### Science Models, Laws, Mechanisms, and Theories Explain Natural Phenomena

#### Disciplinary Core Ideas

- PS3.D: Energy in Chemical Processes and Everyday Life
- LS1.A: Structure and Function
- LS1.C: Organization for Matter and Energy Flow in Organisms
- LS1.D: Information Processing
- LS2.A: Interdependent Relationships in Ecosystems
- LS2.B: Cycles of Matter and Energy Transfer in Ecosystems
- LS2.C: Ecosystem Dynamics, Functioning, and Resilience
- LS4.C: Adaptation
- LS4.D: Biodiversity and Humans

#### Crosscutting Concepts

- Energy and Matter
- Systems and System Models

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Aligned to the Next Generation Science Standards (NGSS)

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Performance Expectations (PE)	Supporting Concepts, Practices, and Ideas
5-PS3-1	Use models to describe phenomena.
	The energy released from food was once energy from the sun that was captured by plants in the chemical process that forms plant matter (from air and water).
	Food provides animals with the materials they need for body repair and growth and the energy they need to maintain body warmth and for motion.
	Energy can be transferred in various ways and between objects.
5-LS1-1	Support an argument with evidence, data, or a model.
	Plants acquire their material for growth chiefly from air and water.
	Matter is transported into, out of, and within systems.
5-LS2-1	The food of almost any kind of animal can be traced back to plants. Organisms are related in food webs in which some animals eat plants for food and other animals eat the animals that eat plants. Some organisms, such as fungi and bacteria, break down dead organisms (both plants or plants parts and animals) and therefore operate as “decomposers.” Decomposition eventually restores (recycles) some materials back to the soil for plants to use. Organisms can survive only in environments in which their particular needs are met. A healthy ecosystem is one in which multiple species of different types are each able to meet their needs in a relatively stable web of life. Newly introduced species can damage the balance of an ecosystem.
	Matter cycles between the air and soil and among plants, animals, and microbes as these organisms live and die. Organisms obtain gases, and water, from the environment, and release waste matter (gas, liquid, or solid) back into the environment.
	Develop a model to describe phenomena.
	Science explanations describe the mechanisms for natural events.
	A system can be described in terms of its components and their interactions.
4-LS1-1	Construct an argument with evidence, data, and/or a model.
	Plants and animals have both internal and external structures that serve various functions in growth, survival, behavior, and reproduction.
	A system can be described in terms of its components and their interactions.
4-LS1-2	Use a model to test interactions concerning the functioning of a natural system.
	Different sense receptors are specialized for particular kinds of information, which may be the processed by the animal’s brain. Animals are able to use their perceptions and memories to guide their actions.
	A system can be described in terms of its components and their interactions.
3-LS4-3	For any particular environment, some kinds of organisms survive well, some survive less well, and some cannot survive at all.
3-LS4-4	When the environment changes in ways that affect a place’s physical characteristics, temperature, or availability of resources, some organisms survive

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	and reproduce, others move to new locations, yet others move into the transformed environment, and some die.
	Populations live in a variety of habitats, and change in those habitats affects the organisms living there.
<b>Related Common Core ELA Standards</b>	
RI.5.1	Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text. (5-LS1-1) (4-LS1-1) (3-LS4-3) (3-LS4-4)
RI.5.2	Determine two or more main ideas of a text and explain how they are supported by key details; summarize the text. (3-LS4-3) (3-LS4-4)
RI.5.3	Explain the relationships or interactions between two or more individuals, events, ideas, or concepts in a historical, scientific, or technical text based on specific information in the text. (3-LS4-3) (3-LS4-4)
RI.5.7	Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently. (5-LS2-1) (5-PS3-1)
RI.5.9	Integrate information from several texts on the same topic in order to write or speak about the subject knowledgeably. (5-LS1-1)
W.5.1	Write opinion pieces on topics or texts, supporting a point of view with reasons and information. (5-LS1-1) (3-LS4-3) (3-LS4-4)
W.5.2	Write informative/explanatory texts to examine a topic and convey ideas and information clearly. (3-LS4-3) (3-LS4-4)
W.5.7	Conduct short research projects that use several sources to build knowledge through investigation of different aspects of a topic. (3-5-ETS1-1) (3-5-ETS1-3)
W.5.8	Recall relevant information from experiences or gather relevant information from print and digital sources; summarize or paraphrase information in notes and finished work, and provide a list of sources. (3-5-ETS1-1) (3-5-ETS1-3)
W.5.9	Draw evidence from literary or informational texts to support analysis, reflection, and research. (3-5-ETS1-1) (3-5-ETS1-3)
SL.5.4	Report on a topic or text or present an opinion, sequencing ideas logically and using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace. (3-LS4-3) (3-LS4-4)
SL.5.5	Include multimedia components (e.g., graphics, sound) and visual displays in presentations when appropriate to enhance the development of main ideas or themes. (5-LS2-1) (5-PS3-1) (4-LS1-2)
<b>Related Common Core Mathematics Standards</b>	
MP.2	Reason abstractly and quantitatively. (5-LS1-1) (5-LS2-1) (3-LS4-3) (3-LS4-4)
MP.4	Model with mathematics. (5-LS1-1) (5-LS2-1) (3-LS4-3) (3-LS4-4)
MP.5	Use appropriate tools strategically. (5-LS1-1)
5.OA	Operations and Algebraic Thinking (3-5-ETS1-1) (3-5-ETS1-2)
5.MD.A.1	Convert among different-sized standard measurement units within a given



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	measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems. (5-LS1-1)
4.G.A.3	Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts. Identify line-symmetric figures and draw lines of symmetry. (4-LS1-1)
3.MD.B.3	Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less" problems using information presented in scaled bar graphs. (3-LS4-3)
<b>Unit Essential Questions</b> <ul style="list-style-type: none"> <li>● <i>How do we classify living things?</i></li> <li>● <i>How do we classify animals?</i></li> <li>● <i>How do we classify plants?</i></li> <li>● <i>What are some physical structures in living things?</i></li> <li>● <i>How do adaptations help plants?</i></li> <li>● <i>How do adaptations help animals?</i></li> <li>● <i>What are the life cycles of some animals?</i></li> <li>● <i>What is the circulatory system?</i></li> <li>● <i>What is the respiratory system?</i></li> <li>● <i>What are the skeletal and muscular systems?</i></li> <li>● <i>What is the nervous system?</i></li> <li>● <i>What are some other systems?</i></li> <li>● <i>What are the parts of an ecosystem?</i></li> <li>● <i>How do organisms interact in ecosystems?</i></li> <li>● <i>How do ecosystems change?</i></li> <li>● <i>How do humans impact ecosystems?</i></li> </ul>	<b>Unit Enduring Understandings</b> <ul style="list-style-type: none"> <li>● <b>Scientific inquiry involves asking scientifically oriented questions, collecting evidence, forming explanations, connecting explanations to scientific knowledge and theory, and communicating and justifying explanations.</b></li> <li>● <b>Safety first!</b></li> <li>● <b>Mathematics is a tool used to model objects, events, and relationships in the natural and designed world.</b></li> <li>● <b>The development of technology and advances in science are mutually supportive in driving innovation in both fields.</b></li> <li>● <b>Physical constraints and social values play a role in limiting the use of technology to solve problems.</b></li> <li>● <b>Thinking systematically means looking for the relationships between parts.</b></li> <li>● <b>All organisms transfer matter and convert energy from one form to another.</b></li> <li>● <b>Both matter and energy are necessary to build and maintain structures within the organism.</b></li> <li>● <b>Organisms are grouped in taxonomy based upon similarity.</b></li> <li>● <b>The structural and functional characteristics of an organism determine their continued survival over time under changing environmental conditions.</b></li> <li>● <b>Organisms and their environments are interconnected.</b></li> <li>● <b>Changes in one part of the system will affect other parts of the system.</b></li> <li>● <b>Humans can alter the living and non-living factors within an ecosystem, thereby creating changes in the overall system.</b></li> </ul>
<b>Unit Learning Targets</b> <i>Students will be Able To:</i> <ul style="list-style-type: none"> <li>● understand how to develop and use a dichotomous key to classify plants and animals</li> <li>● understand that animals can be classified based on their characteristics</li> </ul>	

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- understand that plants can be classified based on their characteristics
- describe similarities and differences in the structures and functions of parts of plants and animals
- understand that plants can survive in different environments because of adaptations
- understand that animals can survive in different environments because of adaptations
- understand how some animals go through metamorphosis
- demonstrate an understanding that the circulatory system moves blood through the body
- explain that the respiratory system is made up of the lungs and other structures, and describe how blood moves oxygen through the body
- describe the functions of the skeleton and muscles
- explain that the nervous system includes the brain, spinal cord, nerves, and sense organs, and that it tells your body how to react to its environment
- describe the parts and functions of several other body systems
- demonstrate an understanding of some ecosystems in which organisms interact
- describe the different ways that organisms interact in an ecosystem
- explain how environments change and describe how some plants and animals survive these changes
- describe how people can affect the environment and change ecosystems

### Unit Vocabulary:

- **Chapter 3:** *classify, dichotomous key, invertebrate, kingdom, phylum, species, vascular, vertebrate*
- **Chapter 4:** *adaptation, exoskeleton, extinct species, metamorphosis*
- **Chapter 5:** *bladder, brain, circulatory system, diaphragm, digestive system, excretory system, heart, intestines, kidney, lungs, muscles, muscular system, nervous system, organ, respiratory system, skeletal system, skeleton, skin, stomach, system, tissue, trachea*
- **Chapter 6:** *community, competition, conservation, consumer, decomposer, ecosystem, environment, food chain, food web, habitat, pollution, population, predator, prey, producer*

### Evidence of Learning

**Summative Assessments at the end of each chapter.**

**Equipment needed:** See teacher's edition

**Teacher Resources:** Pearson Interactive Science

<https://www.pearsonsuccessnet.com/snpapp/login/PsnLandingPage.jsp?showLandingPage=true&ticket=ST-1368125-E9Ki92wc0g5CVII9xxk5-b3-rumba-prod-01-01>

### Formative Assessments

- |   |                                       |
|---|---------------------------------------|
| ● teacher observation                         | ● student interactive science journal |
| ● student responses to questions              | ●                                     |
| ● student participation in inquiry activities | ●                                     |

### Lesson Plans

Chapter 3: <i>Classifying Organisms</i>	Timeframe
Lesson 1 <i>How Do We Classify Living Things?</i>	3-4 class periods
Lesson 2 <i>How Do We Classify Animals?</i>	3-4 class periods

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Lesson 3 <i>How Do We Classify Plants?</i>	<b>3-4 class periods</b>
<b>Inquiry Questions and Labs:</b> <ul style="list-style-type: none"> <li>● <i>How can shells be classified?</i></li> <li>● <i>How can a key help you identify and classify?</i></li> <li>● <b>Lightning Lab: Develop a Dichotomous Key</b></li> <li>● <i>How can you classify animals without backbones?</i></li> <li>● <b>At-Home Lab: Classify Animals</b></li> <li>● <i>How can a chart help you classify living things?</i></li> <li>● <b>At-Home Lab: Classify Plants</b></li> </ul>	
<b>Chapter 4: Growth and Survival</b>	<b>Timeframe</b>
Lesson 1 <i>What Are Some Physical Structures in Living Things?</i>	<b>3-4 class periods</b>
Lesson 2 <i>How Do Adaptations Help Plants?</i>	<b>3-4 class periods</b>
Lesson 3 <i>How Do Adaptations Help Animals?</i>	<b>3-4 class periods</b>
Lesson 4 <i>What Are the Life Cycles of Some Animals</i>	<b>3-4 class periods</b>
<b>Inquiry Questions and Labs:</b> <ul style="list-style-type: none"> <li>● <i>How can temperature affect seed growth?</i></li> <li>● <i>How do seeds grow?</i></li> <li>● <i>How will seeds grow in different materials?</i></li> <li>● <b>At-Home Lab: Parts and the Whole</b></li> <li>● <i>How can plants survive in the desert?</i></li> <li>● <b>Lightning Lab: You Light Up My Leaf</b></li> <li>● <i>Which bird beak can crush seeds?</i></li> <li>● <b>At-Home Lab: Swimming Birds</b></li> <li>● <i>How do butterflies grow and change?</i></li> <li>● <b>At-Home Lab: Growing Up</b></li> </ul>	
<b>Chapter 5: Structure and Function</b>	<b>Timeframe</b>
Lesson 1 <i>What is the Circulatory System?</i>	<b>3-4 class periods</b>
Lesson 2 <i>What is the Respiratory System?</i>	<b>3-4 class periods</b>
Lesson 3 <i>What Are the Skeletal and Muscular Systems?</i>	<b>3-4 class periods</b>
Lesson 4 <i>What is the Nervous System?</i>	<b>3-4 class periods</b>

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Lesson 5 <i>What Are Some Other Systems?</i>	<b>3-4 class periods</b>
<b>Inquiry Questions and Labs:</b> <ul style="list-style-type: none"> <li>● <i>How do parts of the body work together like a system?</i></li> <li>● <i>How much air can you exhale?</i></li> <li>● <i>Does posture affect the amount of air that can be exhaled?</i></li> <li>● <b>At-Home Lab: Read the Label</b></li> <li>● <i>What do you breathe out?</i></li> <li>● <b>Lightning Lab: Breathe It In</b></li> <li>● <i>How do the parts of the skeletal system fit together?</i></li> <li>● <b>At-Home Lab: A Simple Movement</b></li> <li>● <i>What can speed digestion?</i></li> <li>● <b>At-Home Lab: Chew Your Food</b></li> </ul>	
<b>Chapter 6: Ecosystems</b>	<b>Timeframe</b>
Lesson 1 <i>What Are the Parts of an Ecosystem?</i>	<b>3-4 class periods</b>
Lesson 2 <i>How Do Organisms Interact in Ecosystems?</i>	<b>3-4 class periods</b>
Lesson 3 <i>How Do Ecosystems Change?</i>	<b>3-4 class periods</b>
Lesson 4 <i>How Do Humans Impact Ecosystems?</i>	<b>3-4 class periods</b>
<b>Inquiry Questions and Labs:</b> <ul style="list-style-type: none"> <li>● <i>What is in a local ecosystem?</i></li> <li>● <i>What heats up air?</i></li> <li>● <i>How can you use your own carbon dioxide to test what heats up air?</i></li> <li>● <b>At-Home Lab: Eco-Walk</b></li> <li>● <i>What do some molds need to grow?</i></li> <li>● <b>At-Home Lab: You in the Food Chain</b></li> <li>● <b>At-Home Lab: Long Ago</b></li> <li>● <i>Which materials break down fastest in soil?</i></li> <li>● <b>Go Green: Make a Brochure</b></li> </ul>	
<b>Teacher Notes:</b>	
<b>Curriculum Development Resources</b> Click the links below to access additional resources used to design this unit: <ul style="list-style-type: none"> <li>● <b>Next Generation Science Standards (NGSS)</b> <a href="http://www.nextgenscience.org/">http://www.nextgenscience.org/</a></li> <li>● <b>21<sup>st</sup> Century Skills</b> <a href="http://www.p21.org/our-work/p21-framework">http://www.p21.org/our-work/p21-framework</a></li> <li>● <b>New Jersey Standards Clarification Project</b>  <a href="http://www.nj.gov/education/aps/njscp/Phase1allAreas.pdf">http://www.nj.gov/education/aps/njscp/Phase1allAreas.pdf</a></li> </ul>	

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Classifying Organisms: Lesson 1			
<b>Content Area: Science</b>			
<b>Lesson Title:</b> <i>How Do We Classify Living Things?</i>			<b>Timeframe:</b> 3-4 class periods
Lesson Components			
<b>*21<sup>st</sup> Century Themes</b>			
Global Awareness	Financial, Economic, Business, and Entrepreneurial Literacy	Civic Literacy	Health Literacy
<b>*21<sup>st</sup> Century Skills</b>			
x Creativity and Innovation	x Critical Thinking and Problem Solving	x Communication and Collaboration	Information Literacy
Media Literacy	ICT Literacy	x Life and Career Skills	
<b>*Interdisciplinary Connections: see unit overview</b>			
<b>*Integration of Technology: Pearson Interactive Science Program</b>			
<b>*Equipment needed: see teacher's edition</b>			
<b>*Vocabulary: see unit overview for all vocabulary associated with this unit</b>			

Learning Outcomes	Learning Activities/Instructional Strategies
Students Will Be Able To: <ul style="list-style-type: none"> <li>● understand how to develop and use a dichotomous key to classify plants and animals</li> </ul>	<b>Lesson Sequence</b> <ol style="list-style-type: none"> <li>1. <b>Engage:</b> <ol style="list-style-type: none"> <li>a. Students tell about various ways to organize fruit.</li> <li>b. Introduce lesson vocabulary.</li> </ol> </li> <li>2. <b>Explore: My Planet Diary Fun Fact</b></li> <li>3. <b>Explain:</b> <ol style="list-style-type: none"> <li>a. Review lesson question.</li> <li>b. Students read <i>Reasons to Classify, A Classification System, and Dichotomous Keys</i> then answer questions using reading strategies.</li> </ol> </li> <li>4. <b>Lightning Lab: Develop a Dichotomous Key</b> <ol style="list-style-type: none"> <li>a. Students make a dichotomous key to identify different classroom objects.</li> </ol> </li> <li>5. <b>Elaborate:</b></li> </ol>

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	<p>a. <b>Science Notebook:</b> Students write a short list of common plants and animals, then research and write the name of the genus and species of each organism in their Science Notebook.</p> <p>6. <b>Evaluate:</b></p> <p>a. Review lesson vocabulary</p> <p>b. Students complete the Lesson Check blackline master to determine whether they need additional help with lesson content.</p>
<p><b>Differentiation:</b> Embedded in the program are</p> <ul style="list-style-type: none"> <li>● strategies for English Language Learners</li> <li>● leveled readers</li> <li>● resources to address multiple intelligences</li> </ul>	
<p><b>Resources Provided:</b> <i>Pearson Interactive Science</i></p>	

<b>Classifying Organisms: Lesson 2</b>							
<b>Content Area: Science</b>							
<b>Lesson Title:</b> <i>How Do We Classify Animals?</i>				<b>Timeframe:</b> 3-4 class periods			
<b>Lesson Components</b>							
<b><u>*21<sup>st</sup> Century Themes</u></b>							
	Global Awareness		Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy		Health Literacy
<b><u>*21<sup>st</sup> Century Skills</u></b>							
x	Creativity and Innovation	x	Critical Thinking and Problem Solving	x	Communication and Collaboration		Information Literacy
	Media Literacy		ICT Literacy	x	Life and Career Skills		
<b>*Interdisciplinary Connections: see unit overview</b>							
<b>*Integration of Technology: Pearson Interactive Science Program</b>							
<b>*Equipment needed: see teacher's edition</b>							
<b>*Vocabulary: see unit overview for all vocabulary associated with this unit</b>							

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Learning Outcomes	Learning Activities/Instructional Strategies
<p>Students Will Be Able To:</p> <ul style="list-style-type: none"><li>• understand that animals can be classified based on their characteristics</li></ul>	<p><b>Lesson Sequence</b></p> <ol style="list-style-type: none"><li>1. <b>Engage:</b><ol style="list-style-type: none"><li>a. Students describe characteristics of a fish.</li><li>b. Introduce lesson vocabulary.</li></ol></li><li>2. <b>Explore It! <i>How can you classify animals without backbones?</i></b></li><li>3. <b>Explain:</b><ol style="list-style-type: none"><li>a. Review lesson question.</li><li>b. Students read <i>Characteristics of Animals, Vertebrates, and Invertebrates</i> then answer questions using reading strategies.</li></ol></li><li>4. <b>At-Home Lab: <i>Classify Animals</i></b><ol style="list-style-type: none"><li>a. Students find four or five animals and classify the animals by class.</li></ol></li><li>5. <b>Math Connection</b><ol style="list-style-type: none"><li>a. Students calculate the speeds of different invertebrates.</li></ol></li><li>6. <b>Elaborate:</b><ol style="list-style-type: none"><li>a. Students discuss the importance of identifying what you know and what you do not know about an animal to correctly classify it.</li><li>b. Describe a situation about an animal with students and discuss what they need to know to identify what class it belongs to.</li></ol></li><li>7. <b>Evaluate:</b><ol style="list-style-type: none"><li>a. Review lesson vocabulary</li><li>b. Students complete the Lesson Check blackline master to determine whether they need additional help with lesson content.</li></ol></li></ol>
<p><b>Differentiation:</b></p> <p>Embedded in the program are</p> <ul style="list-style-type: none"><li>• strategies for English Language Learners</li><li>• leveled readers</li><li>• resources to address multiple intelligences</li></ul>	
<p><b>Resources Provided:</b> <i>Pearson Interactive Science</i></p>	

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Classifying Organisms: Lesson 3							
<b>Content Area: Science</b>							
<b>Lesson Title:</b> <i>How Do We Classify Plants?</i>				<b>Timeframe:</b> 3-4 class periods			
Lesson Components							
<b><u>*21<sup>st</sup> Century Themes</u></b>							
	Global Awareness		Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy		Health Literacy
<b><u>*21<sup>st</sup> Century Skills</u></b>							
x	Creativity and Innovation	x	Critical Thinking and Problem Solving	x	Communication and Collaboration		Information Literacy
	Media Literacy		ICT Literacy	x	Life and Career Skills		
<b>*Interdisciplinary Connections: see unit overview</b>							
<b>*Integration of Technology: Pearson Interactive Science Program</b>							
<b>*Equipment needed: see teacher's edition</b>							
<b>*Vocabulary: see unit overview for all vocabulary associated with this unit</b>							

Learning Outcomes	Learning Activities/Instructional Strategies
<p>Students Will Be Able To:</p> <ul style="list-style-type: none"> <li>● understand that plants can be classified based on their characteristics</li> </ul>	<p><b>Lesson Sequence</b></p> <ol style="list-style-type: none"> <li>1. <b>Engage:</b> <ol style="list-style-type: none"> <li>a. Students identify visual differences between plants and animals.</li> <li>b. Introduce lesson vocabulary.</li> </ol> </li> <li>2. <b>Explore It! <i>How can a chart help you classify living things?</i></b></li> <li>3. <b>Explain:</b> <ol style="list-style-type: none"> <li>a. Review lesson question.</li> <li>b. Students read <i>Characteristics of Plants and Vascular and Nonvascular</i> then answer questions using reading strategies.</li> </ol> </li> <li>4. <b>At-Home Lab: <i>Classify Plants</i></b></li> </ol>



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	<p>a. Students make a dichotomous key to identify flowering plants.</p> <p>5. <b>Elaborate:</b></p> <p>a. <b>Science Notebook:</b> Students write sentences using the words <i>conifer</i> and <i>cone</i> in their Science Notebook.</p> <p>6. <b>Evaluate:</b></p> <p>a. Review lesson vocabulary</p> <p>b. Students complete the Lesson Check blackline master to determine whether they need additional help with lesson content.</p>
<p><b>Differentiation:</b>                  Embedded in the program are</p> <ul style="list-style-type: none"> <li>• strategies for English Language Learners</li> <li>• leveled readers</li> <li>• resources to address multiple intelligences</li> </ul>	
<p><b>Resources Provided:</b> <i>Pearson Interactive Science</i></p>	

<b>Growth and Survival: Lesson 1</b>					
<b>Content Area: Science</b>					
<b>Lesson Title:</b> <i>What Are Some Physical Structures in Living Things?</i>				<b>Timeframe:</b> 3-4 class periods	
<b>Lesson Components</b>					
<b><u>*21<sup>st</sup> Century Themes</u></b>					
	Global Awareness		Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy
					Health Literacy
<b><u>*21<sup>st</sup> Century Skills</u></b>					
x	Creativity and Innovation	x	Critical Thinking and Problem Solving	x	Communication and Collaboration
	Media Literacy		ICT Literacy	x	Life and Career Skills
<b>*Interdisciplinary Connections: see unit overview</b>					
<b>*Integration of Technology: Pearson Interactive Science Program</b>					
<b>*Equipment needed: see teacher’s edition</b>					
<b>*Vocabulary: see unit overview for all vocabulary associated with this unit</b>					

<b>Learning Outcomes</b>	<b>Learning Activities/Instructional Strategies</b>
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Created for New Jersey school districts through a project of the New Jersey Department of Education, Office of Academic Standards, in partnership with the N.J. Association for Supervision and Curriculum Development and the N.J. Principals and Supervisors Association.

## 5th Grade Wandell School Science Curricula

Aligned to the Next Generation Science Standards (NGSS)

**ENGAGING STUDENTS • FOSTERING ACHIEVEMENT • CULTIVATING 21<sup>ST</sup> CENTURY GLOBAL SKILLS**

<p>Students Will Be Able To:</p> <ul style="list-style-type: none"> <li>● describe similarities and differences in the structures and functions of parts of plants and animals</li> </ul>	<p><b>Lesson Sequence</b></p> <ol style="list-style-type: none"> <li>1. <b>Engage:</b> <ol style="list-style-type: none"> <li>a. Students circle parts of the frog’s body they can see through its skin.</li> <li>b. Introduce lesson vocabulary.</li> </ol> </li> <li>2. <b>Explore: My Planet Diary Connections</b></li> <li>3. <b>Explain:</b> <ol style="list-style-type: none"> <li>a. Review lesson question.</li> <li>b. Students read <i>Physical Structures, Structures for Support, Structures for Reproduction, and Structures for Respiration and Circulation</i> then answer questions using reading strategies.</li> </ol> </li> <li>4. <b>At-Home Lab: Parts and the Whole</b> <ol style="list-style-type: none"> <li>a. Students think of three systems that they can find in their home.</li> </ol> </li> <li>5. <b>Elaborate:</b> <ol style="list-style-type: none"> <li>a. <b>Science Notebook:</b> Students find information about an animal that molts and write a description about their chosen animal’s molting process.</li> </ol> </li> <li>6. <b>Evaluate:</b> <ol style="list-style-type: none"> <li>a. Review lesson vocabulary</li> <li>c. Students complete the Lesson Check blackline master to determine whether they need additional help with lesson content.</li> </ol> </li> </ol>
<p><b>Differentiation:</b> Embedded in the program are</p> <ul style="list-style-type: none"> <li>● strategies for English Language Learners</li> <li>● leveled readers</li> <li>● resources to address multiple intelligences</li> </ul>	
<p><b>Resources Provided:</b> <i>Pearson Interactive Science</i></p>	

<b>Growth and Survival: Lesson 2</b>	
<b>Content Area: Science</b>	
<b>Lesson Title:</b> <i>How Do Adaptations Help Plants?</i>	<b>Timeframe:</b> 3-4 class periods
<b>Lesson Components</b>	
<b><u>*21<sup>st</sup> Century Themes</u></b>	

## 5th Grade Wandell School Science Curricula

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**ENGAGING STUDENTS • FOSTERING ACHIEVEMENT • CULTIVATING 21<sup>ST</sup> CENTURY GLOBAL SKILLS**

	Global Awareness		Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy		Health Literacy
<b><u>*21<sup>st</sup> Century Skills</u></b>							
x	Creativity and Innovation	x	Critical Thinking and Problem Solving	x	Communication and Collaboration	x	Information Literacy
	Media Literacy		ICT Literacy	x	Life and Career Skills		
<b>*Interdisciplinary Connections: see unit overview</b>							
<b>*Integration of Technology: Pearson Interactive Science Program</b>							
<b>*Equipment needed: see teacher's edition</b>							
<b>*Vocabulary: see unit overview for all vocabulary associated with this unit</b>							

Learning Outcomes	Learning Activities/Instructional Strategies
<p>Students Will Be Able To:</p> <ul style="list-style-type: none"> <li>● understand that plants can survive in different environments because of adaptations</li> </ul>	<p><b>Lesson Sequence</b></p> <ol style="list-style-type: none"> <li>1. <b>Engage:</b> <ol style="list-style-type: none"> <li>a. Students write three things they think plants get from their environment.</li> <li>b. Introduce lesson vocabulary.</li> </ol> </li> <li>2. <b>Explore It! <i>How can plants survive in the desert?</i></b></li> <li>3. <b>Explain:</b> <ol style="list-style-type: none"> <li>a. Review lesson question.</li> <li>b. Students read <i>Plant Adaptations</i> and <i>Succession</i> then answer questions using reading strategies.</li> </ol> </li> <li>4. <b>Lightning Lab: <i>You Light Up My Leaf</i></b> <ol style="list-style-type: none"> <li>a. Students make a card on a stick to represent a leaf on a plant.</li> </ol> </li> <li>5. <b>Elaborate:</b> <ol style="list-style-type: none"> <li>a. Students learn that seeds of plants that live near water are often dispersed through the water. Students find examples of plants that live near the water and explain the adaptations that allow them to reproduce.</li> </ol> </li> <li>6. <b>Evaluate:</b> <ol style="list-style-type: none"> <li>a. Review lesson vocabulary</li> <li>b. Students complete the Lesson Check blackline</li> </ol> </li> </ol>

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	master to determine whether they need additional help with lesson content.
<b>Differentiation:</b> Embedded in the program are <ul style="list-style-type: none"> <li>• strategies for English Language Learners</li> <li>• leveled readers</li> <li>• resources to address multiple intelligences</li> </ul>	
<b>Resources Provided:</b> <i>Pearson Interactive Science</i>	

Growth and Survival: Lesson 3					
<b>Content Area: Science</b>					
<b>Lesson Title:</b> <i>How Do Adaptations Help Animals?</i>				<b>Timeframe:</b> 3-4 class periods	
Lesson Components					
<b><u>*21<sup>st</sup> Century Themes</u></b>					
	Global Awareness		Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy
					Health Literacy
<b><u>*21<sup>st</sup> Century Skills</u></b>					
x	Creativity and Innovation	x	Critical Thinking and Problem Solving	x	Communication and Collaboration
	Media Literacy		ICT Literacy	x	Life and Career Skills
<b>*Interdisciplinary Connections: see unit overview</b>					
<b>*Integration of Technology: Pearson Interactive Science Program</b>					
<b>*Equipment needed: see teacher's edition</b>					
<b>*Vocabulary: see unit overview for all vocabulary associated with this unit</b>					

Learning Outcomes	Learning Activities/Instructional Strategies
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Aligned to the Next Generation Science Standards (NGSS)

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<p>Students Will Be Able To:</p> <ul style="list-style-type: none"><li>● understand that animals can survive in different environments because of adaptations</li></ul>	<p><b>Lesson Sequence</b></p> <ol style="list-style-type: none"><li>1. <b>Engage:</b><ol style="list-style-type: none"><li>a. Students tell what part of an animal's body is adapted for gliding.</li><li>b. Introduce lesson vocabulary.</li></ol></li><li>2. <b>Explore It! Which bird beak can crush seeds?</b></li><li>3. <b>Explain:</b><ol style="list-style-type: none"><li>a. Review lesson question.</li><li>b. Students read <i>Animal Adaptations</i> then answer questions using reading strategies.</li></ol></li><li>4. <b>At-Home Lab: Swimming Birds</b><ol style="list-style-type: none"><li>a. Students explain how the webbing on a duck's feet helps it.</li></ol></li><li>5. <b>Elaborate:</b><ol style="list-style-type: none"><li>a. Students learn that the ability to produce pheromones is an important adaptation of many insects. Students explain how farmers could use these pheromones to protect their crops.</li></ol></li><li>6. <b>Evaluate:</b><ol style="list-style-type: none"><li>a. Review lesson vocabulary</li><li>b. Students complete the Lesson Check blackline master to determine whether they need additional help with lesson content.</li></ol></li></ol>
<p><b>Differentiation:</b></p> <p>Embedded in the program are</p> <ul style="list-style-type: none"><li>● strategies for English Language Learners</li><li>● leveled readers</li><li>● resources to address multiple intelligences</li></ul>	
<p><b>Resources Provided:</b> <i>Pearson Interactive Science</i></p>	

### Growth and Survival: Lesson 4

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<b>Content Area: Science</b>				
<b>Lesson Title:</b> <i>What Are the Life Cycles of Some Animals?</i>			<b>Timeframe:</b> 3-4 class periods	
<b>Lesson Components</b>				
<b>*21<sup>st</sup> Century Themes</b>				
	Global Awareness		Financial, Economic, Business, and Entrepreneurial Literacy	Civic Literacy
				Health Literacy
<b>*21<sup>st</sup> Century Skills</b>				
x	Creativity and Innovation	x	Critical Thinking and Problem Solving	x
				Communication and Collaboration
				Information Literacy
	Media Literacy		ICT Literacy	x
				Life and Career Skills
<b>*Interdisciplinary Connections: see unit overview</b>				
<b>*Integration of Technology: Pearson Interactive Science Program</b>				
<b>*Equipment needed: see teacher’s edition</b>				
<b>*Vocabulary: see unit overview for all vocabulary associated with this unit</b>				

Learning Outcomes	Learning Activities/Instructional Strategies
<p>Students Will Be Able To:</p> <ul style="list-style-type: none"> <li>understand how some animals go through metamorphosis</li> </ul>	<p><b>Lesson Sequence</b></p> <ol style="list-style-type: none"> <li><b>Engage:</b> <ol style="list-style-type: none"> <li>Students tell why they think a butterfly might need a chrysalis.</li> <li>Introduce lesson vocabulary.</li> </ol> </li> <li><b>Explore It! <i>How do butterflies grow and change?</i></b></li> <li><b>Explain:</b> <ol style="list-style-type: none"> <li>Review lesson question.</li> <li>Students read <i>Metamorphosis, Amphibian Metamorphosis, Complete Metamorphosis, and Incomplete Metamorphosis</i> then answer questions using reading strategies.</li> </ol> </li> <li><b>At-Home Lab: <i>Growing Up</i></b> <ol style="list-style-type: none"> <li>Students find a baby photo and a current photo, then compare characteristics and write how they changed.</li> </ol> </li> <li><b>Elaborate:</b> <ol style="list-style-type: none"> <li><b>Science Notebook:</b> Students use the Internet to find images of different kinds of caterpillars</li> </ol> </li> </ol>

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	<p>and the butterflies or moths they develop into. Students label and paste the images in their Science Notebook.</p> <p><b>6. Evaluate:</b></p> <ol style="list-style-type: none"> <li>a. Review lesson vocabulary</li> <li>b. Students complete the Lesson Check blackline master to determine whether they need additional help with lesson content.</li> </ol>
<p><b>Differentiation:</b> Embedded in the program are</p> <ul style="list-style-type: none"> <li>• strategies for English Language Learners</li> <li>• leveled readers</li> <li>• resources to address multiple intelligences</li> </ul>	
<p><b>Resources Provided:</b> <i>Pearson Interactive Science</i></p>	

<b>Structure and Function: Lesson 1</b>							
<b>Content Area: Science</b>							
<b>Lesson Title:</b> <i>What is the Circulatory System?</i>				<b>Timeframe:</b> 3-4 class periods			
<b>Lesson Components</b>							
<b><u>*21<sup>st</sup> Century Themes</u></b>							
	Global Awareness		Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy		Health Literacy
<b><u>*21<sup>st</sup> Century Skills</u></b>							
x	Creativity and Innovation	x	Critical Thinking and Problem Solving	x	Communication and Collaboration		Information Literacy
	Media Literacy		ICT Literacy	x	Life and Career Skills		
<b>*Interdisciplinary Connections: see unit overview</b>							
<b>*Integration of Technology: Pearson Interactive Science Program</b>							
<b>*Equipment needed: see teacher's edition</b>							
<b>*Vocabulary: see unit overview for all vocabulary associated with this unit</b>							

## 5th Grade Wandell School Science Curricula

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Learning Outcomes	Learning Activities/Instructional Strategies
<p>Students Will Be Able To:</p> <ul style="list-style-type: none"> <li>● demonstrate an understanding that the circulatory system moves blood through the body</li> </ul>	<p><b>Lesson Sequence</b></p> <ol style="list-style-type: none"> <li>1. <b>Engage:</b> <ol style="list-style-type: none"> <li>a. Students discuss how they think a highway system is like blood vessels.</li> <li>b. Introduce lesson vocabulary.</li> </ol> </li> <li>2. <b>Explore: My Planet Diary Science Stats</b></li> <li>3. <b>Explain:</b> <ol style="list-style-type: none"> <li>a. Review lesson question.</li> <li>b. Students read <i>Cells to Organs, Circulatory System, Parts of the Heart, and Blood Flow Through the Heart</i> then answer questions using reading strategies.</li> </ol> </li> <li>4. <b>At-Home Lab: Read the Label</b> <ol style="list-style-type: none"> <li>a. Students read food labels on a variety of foods and record the fat content.</li> </ol> </li> <li>5. <b>Elaborate:</b> <ol style="list-style-type: none"> <li>a. Students learn that the word <i>circulation</i> means “going around,” and compile a list of things that circulate.</li> </ol> </li> <li>6. <b>Evaluate:</b> <ol style="list-style-type: none"> <li>a. Review lesson vocabulary</li> <li>b. Students complete the Lesson Check blackline master to determine whether they need additional help with lesson content.</li> </ol> </li> </ol>
<p><b>Differentiation:</b> Embedded in the program are</p> <ul style="list-style-type: none"> <li>● strategies for English Language Learners</li> <li>● leveled readers</li> <li>● resources to address multiple intelligences</li> </ul>	
<p><b>Resources Provided:</b> <i>Pearson Interactive Science</i></p>	

Structure and Function: Lesson 2	
<b>Content Area: Science</b>	
<b>Lesson Title:</b> <i>What is the Respiratory System?</i>	<b>Timeframe:</b> 3-4 class periods
Lesson Components	
<b>*21<sup>st</sup> Century Themes</b>	



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	Global Awareness		Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy		Health Literacy
<b><u>*21<sup>st</sup> Century Skills</u></b>							
x	Creativity and Innovation	x	Critical Thinking and Problem Solving	x	Communication and Collaboration	x	Information Literacy
	Media Literacy		ICT Literacy	x	Life and Career Skills		
<b>*Interdisciplinary Connections: see unit overview</b>							
<b>*Integration of Technology: Pearson Interactive Science Program</b>							
<b>*Equipment needed: see teacher's edition</b>							
<b>*Vocabulary: see unit overview for all vocabulary associated with this unit</b>							

Learning Outcomes	Learning Activities/Instructional Strategies
<p>Students Will Be Able To:</p> <ul style="list-style-type: none"> <li>● explain that the respiratory system is made up of the lungs and other structures, and describe how blood moves oxygen through the body</li> </ul>	<p><b>Lesson Sequence</b></p> <ol style="list-style-type: none"> <li>1. <b>Engage:</b> <ol style="list-style-type: none"> <li>a. Students discuss how a musician playing the trumpet is using his respiratory system.</li> <li>b. Introduce lesson vocabulary.</li> </ol> </li> <li>2. <b>Explore It! <i>What do you breathe out?</i></b></li> <li>3. <b>Explain:</b> <ol style="list-style-type: none"> <li>a. Review lesson question.</li> <li>b. Students read <i>The Respiratory System, Parts of the Respiratory System</i>, and <i>Getting Oxygen to Cells</i> then answer questions using reading strategies.</li> </ol> </li> <li>4. <b>Lightning Lab: <i>Breathe It In</i></b> <ol style="list-style-type: none"> <li>a. Students take a deep breath and exhale while slouching and sitting straight up.</li> </ol> </li> <li>5. <b>Math Connection</b> <ol style="list-style-type: none"> <li>a. Students find the surface area of some blocks.</li> </ol> </li> <li>6. <b>Elaborate:</b> <ol style="list-style-type: none"> <li>a. <b>Science Notebook:</b> Students explain how the prefix <i>dia-</i> applies to the word <i>diaphragm</i>.</li> </ol> </li> <li>7. <b>Evaluate:</b> <ol style="list-style-type: none"> <li>a. Review lesson vocabulary</li> <li>b. Students complete the Lesson Check blackline master to determine whether they need additional help with lesson content.</li> </ol> </li> </ol>

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### **Differentiation:**

Embedded in the program are

- strategies for English Language Learners
- leveled readers
- resources to address multiple intelligences

**Resources Provided:** *Pearson Interactive Science*

Structure and Function: Lesson 3							
<b>Content Area: Science</b>							
<b>Lesson Title:</b> <i>What Are the Skeletal and Muscular Systems?</i>				<b>Timeframe:</b> 3-4 class periods			
Lesson Components							
<b><u>*21<sup>st</sup> Century Themes</u></b>							
	Global Awareness		Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy		Health Literacy
<b><u>*21<sup>st</sup> Century Skills</u></b>							
x	Creativity and Innovation	x	Critical Thinking and Problem Solving	x	Communication and Collaboration		Information Literacy
	Media Literacy		ICT Literacy	x	Life and Career Skills		
<b>*Interdisciplinary Connections: see unit overview</b>							
<b>*Integration of Technology: Pearson Interactive Science Program</b>							
<b>*Equipment needed: see teacher's edition</b>							
<b>*Vocabulary: see unit overview for all vocabulary associated with this unit</b>							

Learning Outcomes	Learning Activities/Instructional Strategies
Students Will Be Able To: <ul style="list-style-type: none"> <li>● describe the functions of the skeleton and muscles</li> </ul>	<b>Lesson Sequence</b> <ol style="list-style-type: none"> <li>1. <b>Engage:</b> <ol style="list-style-type: none"> <li>a. Students discuss how structural supports work.</li> <li>b. Introduce lesson vocabulary.</li> </ol> </li> <li>2. <b>Explore It! <i>How do the parts of the skeletal system fit together?</i></b></li> <li>3. <b>Explain:</b> <ol style="list-style-type: none"> <li>a. Review lesson question.</li> <li>b. Students read <i>Skeletal System, Muscular System, Systems Working Together</i>, and</li> </ol> </li> </ol>

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	<p style="text-align: right;"><i>Muscle- and Bone-Building Materials</i> then answer questions using reading strategies.</p> <ol style="list-style-type: none"> <li>4. <b>At-Home Lab: A Simple Movement</b> <ol style="list-style-type: none"> <li>a. Students make a simple movement and identify the muscles that worked together to produce the movement.</li> </ol> </li> <li>5. <b>Math Connection</b> <ol style="list-style-type: none"> <li>a. Students use a protractor to measure angles.</li> </ol> </li> <li>6. <b>Elaborate:</b> <ol style="list-style-type: none"> <li>a. <b>Science Notebook:</b> Students describe and illustrate several activities in which they used their biceps and triceps muscles.</li> </ol> </li> <li>7. <b>Evaluate:</b> <ol style="list-style-type: none"> <li>a. Review lesson vocabulary</li> <li>b. Students complete the Lesson Check blackline master to determine whether they need additional help with lesson content.</li> </ol> </li> </ol>
<p><b>Differentiation:</b> Embedded in the program are</p> <ul style="list-style-type: none"> <li>• strategies for English Language Learners</li> <li>• leveled readers</li> <li>• resources to address multiple intelligences</li> </ul>	
<p><b>Resources Provided:</b> <i>Pearson Interactive Science</i></p>	

Structure and Function: Lesson 4						
<b>Content Area: Science</b>						
<b>Lesson Title:</b> <i>What is the Nervous System?</i>				<b>Timeframe:</b> 3-4 class periods		
Lesson Components						
<b><u>*21<sup>st</sup> Century Themes</u></b>						
	Global Awareness		Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy	Health Literacy
<b><u>*21<sup>st</sup> Century Skills</u></b>						
x	Creativity and Innovation	x	Critical Thinking and Problem Solving	x	Communication and Collaboration	Information Literacy
	Media Literacy		ICT Literacy	x	Life and Career Skills	
<b>*Interdisciplinary Connections: see unit overview</b>						

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**\*Integration of Technology:** Pearson Interactive Science Program

**\*Equipment needed:** see teacher's edition

**\*Vocabulary:** see unit overview for all vocabulary associated with this unit

Learning Outcomes	Learning Activities/Instructional Strategies
<p>Students Will Be Able To:</p> <ul style="list-style-type: none"> <li>● explain that the nervous system includes the brain, spinal cord, nerves, and sense organs, and that it tells your body how to react to its environment</li> </ul>	<p><b>Lesson Sequence</b></p> <ol style="list-style-type: none"> <li>1. <b>Engage:</b> <ol style="list-style-type: none"> <li>a. Students determine which square is darker.</li> <li>b. Introduce lesson vocabulary.</li> </ol> </li> <li>2. <b>Explore It! <i>What is your reaction time?</i></b></li> <li>3. <b>Explain:</b> <ol style="list-style-type: none"> <li>a. Review lesson question.</li> <li>b. Students read <i>Nervous System, Nerves, Spinal Cord, Brain Functions, and Senses and Sense Organs</i> then answer questions using reading strategies.</li> </ol> </li> <li>4. <b>Lightning Lab: <i>The Blink of an Eye</i></b> <ol style="list-style-type: none"> <li>a. Students count the number of blinks a classmate makes.</li> </ol> </li> <li>5. <b>Elaborate:</b> <ol style="list-style-type: none"> <li>a. <b>Science Notebook:</b> Students write examples of activities that each part of the brain controls in their Science Notebook.</li> </ol> </li> <li>6. <b>Evaluate:</b> <ol style="list-style-type: none"> <li>a. Review lesson vocabulary</li> <li>b. Students complete the Lesson Check blackline master to determine whether they need additional help with lesson content.</li> </ol> </li> </ol>
<p><b>Differentiation:</b></p> <p>Embedded in the program are</p> <ul style="list-style-type: none"> <li>● strategies for English Language Learners</li> <li>● leveled readers</li> <li>● resources to address multiple intelligences</li> </ul>	
<p><b>Resources Provided:</b> <i>Pearson Interactive Science</i></p>	

### Structure and Function: Lesson 5

**Content Area:** Science

**Lesson Title:** *What Are Some Other Systems?*

**Timeframe:** 3-4 class periods

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Lesson Components				
<b>*21<sup>st</sup> Century Themes</b>				
	Global Awareness		Financial, Economic, Business, and Entrepreneurial Literacy	Civic Literacy
<b>*21<sup>st</sup> Century Skills</b>				
x	Creativity and Innovation	x	Critical Thinking and Problem Solving	x
		Communication and Collaboration		Information Literacy
Media Literacy		ICT Literacy		x
Life and Career Skills				
<b>*Interdisciplinary Connections: see unit overview</b>				
<b>*Integration of Technology: Pearson Interactive Science Program</b>				
<b>*Equipment needed: see teacher’s edition</b>				
<b>*Vocabulary: see unit overview for all vocabulary associated with this unit</b>				

Learning Outcomes	Learning Activities/Instructional Strategies
<p>Students Will Be Able To:</p> <ul style="list-style-type: none"> <li>● describe the parts and the functions of several other body systems</li> </ul>	<p><b>Lesson Sequence</b></p> <ol style="list-style-type: none"> <li>1. <b>Engage:</b> <ol style="list-style-type: none"> <li>a. Students discuss how a kitchen tool is similar to their digestive system.</li> <li>b. Introduce lesson vocabulary.</li> </ol> </li> <li>2. <b>Explore It! <i>What can speed digestion?</i></b></li> <li>3. <b>Explain:</b> <ol style="list-style-type: none"> <li>a. Review lesson question.</li> <li>b. Students read <i>Digestive System, Stomach, Intestines, Liver and Pancreas, Excretory System</i> and <i>Reproductive System</i> then answer questions using reading strategies.</li> </ol> </li> <li>4. <b>At-Home Lab: <i>Chew Your Food</i></b> <ol style="list-style-type: none"> <li>a. Students put a saltine cracker in their mouth and chew it for five minutes without swallowing.</li> </ol> </li> <li>5. <b>Elaborate:</b> <ol style="list-style-type: none"> <li>a. <b>Science Notebook:</b> Students write a paragraph that explains how a kidney and a coffee filter are alike and different in their Science Notebook.</li> </ol> </li> <li>6. <b>Evaluate:</b></li> </ol>

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	<ul style="list-style-type: none"> <li>a. Review lesson vocabulary</li> <li>b. Students complete the Lesson Check blackline master to determine whether they need additional help with lesson content.</li> </ul>
<b>Differentiation:</b> Embedded in the program are <ul style="list-style-type: none"> <li>• strategies for English Language Learners</li> <li>• leveled readers</li> <li>• resources to address multiple intelligences</li> </ul>	
<b>Resources Provided:</b> <i>Pearson Interactive Science</i>	

Ecosystems: Lesson 1							
<b>Content Area: Science</b>							
<b>Lesson Title:</b> <i>What Are the Parts of an Ecosystem?</i>				<b>Timeframe:</b> 3-4 class periods			
Lesson Components							
<b><u>*21<sup>st</sup> Century Themes</u></b>							
	Global Awareness		Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy		Health Literacy
<b><u>*21<sup>st</sup> Century Skills</u></b>							
x	Creativity and Innovation	x	Critical Thinking and Problem Solving	x	Communication and Collaboration		Information Literacy
	Media Literacy		ICT Literacy	x	Life and Career Skills		
<b>*Interdisciplinary Connections: see unit overview</b>							
<b>*Integration of Technology: Pearson Interactive Science Program</b>							
<b>*Equipment needed: see teacher’s edition</b>							
<b>*Vocabulary: see unit overview for all vocabulary associated with this unit</b>							

Learning Outcomes	Learning Activities/Instructional Strategies
Students Will Be Able To: <ul style="list-style-type: none"> <li>• demonstrate an understanding of some ecosystems in which organisms live and</li> </ul>	<b>Lesson Sequence</b> 1. <b>Engage:</b>

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interact	<ol style="list-style-type: none"> <li style="margin-left: 20px;">a. Students tell how living things interact with nonliving things in an ecosystem.</li> <li style="margin-left: 20px;">b. Introduce lesson vocabulary.</li> </ol> <ol style="list-style-type: none"> <li>2. <b>Explore: My Planet Diary <i>Voices From History</i></b></li> <li>3. <b>Explain:</b> <ol style="list-style-type: none"> <li>a. Review lesson question.</li> <li>b. Students read <i>Ecosystems, Types of Ecosystems, Other Types of Ecosystems, Balance in Ecosystems, and Limiting Factors</i> then answer questions using reading strategies.</li> </ol> </li> <li>4. <b>At-Home Lab: <i>Eco-Walk</i></b> <ol style="list-style-type: none"> <li>a. Students observe and record the living and nonliving things outside, then compare what they observed with what they read about the ecosystem where they live.</li> </ol> </li> <li>5. <b>Elaborate:</b> <ol style="list-style-type: none"> <li>a. Students learn that a population is only made up of one species, even if the organisms seem alike. Students explain what populations they might find in a forest.</li> </ol> </li> <li>6. <b>Evaluate:</b> <ol style="list-style-type: none"> <li>a. Review lesson vocabulary</li> <li>b. Students complete the Lesson Check blackline master to determine whether they need additional help with lesson content.</li> </ol> </li> </ol>
<p><b>Differentiation:</b> Embedded in the program are</p> <ul style="list-style-type: none"> <li>● strategies for English Language Learners</li> <li>● leveled readers</li> <li>● resources to address multiple intelligences</li> </ul>	
<p><b>Resources Provided:</b> <i>Pearson Interactive Science</i></p>	

<b>Ecosystems: Lesson 2</b>	
<b>Content Area: Science</b>	
<b>Lesson Title:</b> <i>How Do Organisms Interact in Ecosystems?</i>	<b>Timeframe:</b> 3-4 class periods
<b>Lesson Components</b>	
<b><u>*21<sup>st</sup> Century Themes</u></b>	

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	Global Awareness		Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy		Health Literacy
<b><u>*21<sup>st</sup> Century Skills</u></b>							
x	Creativity and Innovation	x	Critical Thinking and Problem Solving	x	Communication and Collaboration	x	Information Literacy
	Media Literacy		ICT Literacy	x	Life and Career Skills		
<b>*Interdisciplinary Connections: see unit overview</b>							
<b>*Integration of Technology: Pearson Interactive Science Program</b>							
<b>*Equipment needed: see teacher's edition</b>							
<b>*Vocabulary: see unit overview for all vocabulary associated with this unit</b>							

Learning Outcomes	Learning Activities/Instructional Strategies
<p>Students Will Be Able To:</p> <ul style="list-style-type: none"> <li>● describe the different ways that organisms interact in an ecosystem</li> </ul>	<p><b>Lesson Sequence</b></p> <ol style="list-style-type: none"> <li>1. <b>Engage:</b> <ol style="list-style-type: none"> <li>a. Students tell how the zebra and birds might interact.</li> <li>b. Introduce lesson vocabulary.</li> </ol> </li> <li>2. <b>Explore It! <i>What do some molds need to grow?</i></b></li> <li>3. <b>Explain:</b> <ol style="list-style-type: none"> <li>a. Review lesson question.</li> <li>b. Students read <i>Interactions in Ecosystems, Energy Roles in Ecosystems, Food Chains, Food Webs, Roles in Ecosystems, and Sybiosis</i> then answer questions using reading strategies.</li> </ol> </li> <li>4. <b>At-Home Lab: <i>You in the Food Chain</i></b></li> <li>5. <b>Math Connection:</b> <ol style="list-style-type: none"> <li>a. Students use a graph to learn how to read and interpret it.</li> </ol> </li> <li>6. <b>Elaborate:</b> <ol style="list-style-type: none"> <li>a. <b>Science Notebook:</b> Students discuss the sequence of energy in a prairie food chain and write the food chain in their Science Notebook.</li> </ol> </li> <li>7. <b>Evaluate:</b> <ol style="list-style-type: none"> <li>a. Review lesson vocabulary</li> <li>b. Students complete the Lesson Check blackline master to determine whether they need additional help with lesson content.</li> </ol> </li> </ol>
<b>Differentiation:</b>	

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Embedded in the program are

- strategies for English Language Learners
- leveled readers
- resources to address multiple intelligences

**Resources Provided:** *Pearson Interactive Science*

Ecosystems: Lesson 3							
<b>Content Area: Science</b>							
<b>Lesson Title:</b> <i>How Do Ecosystems Change?</i>				<b>Timeframe:</b> 3-4 class periods			
Lesson Components							
<b><u>*21<sup>st</sup> Century Themes</u></b>							
	Global Awareness		Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy		Health Literacy
<b><u>*21<sup>st</sup> Century Skills</u></b>							
x	Creativity and Innovation	x	Critical Thinking and Problem Solving	x	Communication and Collaboration	x	Information Literacy
	Media Literacy		ICT Literacy	x	Life and Career Skills		
<b>*Interdisciplinary Connections: see unit overview</b>							
<b>*Integration of Technology: Pearson Interactive Science Program</b>							
<b>*Equipment needed: see teacher's edition</b>							
<b>*Vocabulary: see unit overview for all vocabulary associated with this unit</b>							

Learning Outcomes	Learning Activities/Instructional Strategies
<p>Students Will Be Able To:</p> <ul style="list-style-type: none"> <li>• explain how environments change and describe how some animals and plants survive these changes.</li> </ul>	<p><b>Lesson Sequence</b></p> <ol style="list-style-type: none"> <li>1. <b>Engage:</b> <ol style="list-style-type: none"> <li>a. Students describe what benefits a fallen tree might have for other organisms.</li> <li>b. Introduce lesson vocabulary.</li> </ol> </li> <li>2. <b>Explore: My Planet Diary Fun Fact</b></li> <li>3. <b>Explain:</b> <ol style="list-style-type: none"> <li>a. Review lesson question.</li> <li>b. Students read <i>Environmental Changes, Slow Changes, Fast Changes, Changes Caused by Organisms, Changes Caused by Humans,</i></li> </ol> </li> </ol>

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	<p style="text-align: right;"><i>Adapting to Changes</i>, and <i>Survival</i> then answer questions using reading strategies.</p> <p>4. <b>At-Home Lab: Long Ago</b></p> <p style="padding-left: 20px;">a. Students find out what their region was like 10, 100, and 1,000 years ago.</p> <p>5. <b>Math Connection:</b></p> <p style="padding-left: 20px;">a. Students subtract fractions from whole numbers.</p> <p>6. <b>Elaborate:</b></p> <p style="padding-left: 20px;">a. <b>Science Notebook:</b> Students think about what their community might look like in 20-30 years and discuss changes to bodies of water, wooded areas, and the numbers of living things, then list possible effects of these changes.</p> <p>7. <b>Evaluate:</b></p> <p style="padding-left: 20px;">a. Review lesson vocabulary</p> <p style="padding-left: 20px;">b. Students complete the Lesson Check blackline master to determine whether they need additional help with lesson content.</p>
<p><b>Differentiation:</b></p> <p>Embedded in the program are</p> <ul style="list-style-type: none"> <li>● strategies for English Language Learners</li> <li>● leveled readers</li> <li>● resources to address multiple intelligences</li> </ul>	
<p><b>Resources Provided:</b> <i>Pearson Interactive Science</i></p>	

<b>Ecosystems: Lesson 4</b>						
<b>Content Area: Science</b>						
<b>Lesson Title:</b> <i>How Do Humans Impact Ecosystems?</i>				<b>Timeframe:</b> 3-4 class periods		
<b>Lesson Components</b>						
<b><u>*21<sup>st</sup> Century Themes</u></b>						
	Global Awareness		Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy	Health Literacy
<b><u>*21<sup>st</sup> Century Skills</u></b>						
x	Creativity and Innovation	x	Critical Thinking and Problem Solving	x	Communication and Collaboration	Information Literacy

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Media Literacy	ICT Literacy	x	Life and Career Skills
<b>*Interdisciplinary Connections: see unit overview</b>			
<b>*Integration of Technology: Pearson Interactive Science Program</b>			
<b>*Equipment needed: see teacher's edition</b>			
<b>*Vocabulary: see unit overview for all vocabulary associated with this unit</b>			

Learning Outcomes	Learning Activities/Instructional Strategies
<p>Students Will Be Able To:</p> <ul style="list-style-type: none"> <li>● describe how people can affect the environment and change ecosystems</li> </ul>	<p><b>Lesson Sequence</b></p> <ol style="list-style-type: none"> <li>1. <b>Engage:</b> <ol style="list-style-type: none"> <li>a. Students discuss how buildings and other man-made structures might affect the environment.</li> <li>b. Introduce lesson vocabulary.</li> </ol> </li> <li>2. <b>Explore It! <i>Which materials break down fastest in soil?</i></b></li> <li>3. <b>Explain:</b> <ol style="list-style-type: none"> <li>a. Review lesson question.</li> <li>b. Students read <i>People Change Ecosystems</i> then answer questions using reading strategies.</li> </ol> </li> <li>4. <b>Go Green: <i>Make a Brochure</i></b> <ol style="list-style-type: none"> <li>a. Students make a brochure that describes a nonnative species in their area and give ideas on how to control that species' population.</li> </ol> </li> <li>5. <b>Elaborate:</b> <ol style="list-style-type: none"> <li>a. <b>Science Notebook:</b> Students write about things that help people but may harm an ecosystem, such as a construction project that disrupts animal habitats in their Science Notebook.</li> </ol> </li> <li>6. <b>Evaluate:</b> <ol style="list-style-type: none"> <li>a. Review lesson vocabulary</li> <li>b. Students complete the Lesson Check blackline master to determine whether they need additional help with lesson content.</li> </ol> </li> </ol>
<p><b>Differentiation:</b></p> <p>Embedded in the program are</p> <ul style="list-style-type: none"> <li>● strategies for English Language Learners</li> <li>● leveled readers</li> <li>● resources to address multiple intelligences</li> </ul>	
<p><b>Resources Provided:</b> <i>Pearson Interactive Science</i></p>	

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### Unit C Overview

**Content Area:** Science

**Unit Title:** Unit C Earth Science: *The Water Cycle and Weather, Earth's Surface, and Earth and Space*

**Target Course/Grade Level:** 5

#### Unit Background

Matter can exist in three states: liquid, solid, and gas. The three states of water are liquid water, ice, and water vapor. The molecules in liquid water move freely in all directions, so some of these molecules are moving upward. The fastest of these molecules leave the liquid's surface and become water vapor; this is evaporation. Evaporation occurs at any temperature, but more rapidly at higher temperatures.

The molecules in water vapor move more freely than in liquid water, but as the water vapor cools, the molecules slow down and become closer together, thus becoming liquid water; this is condensation. When the temperature drops to 0°C (32°F), liquid water freezes into ice and the molecules move the slowest. At temperatures above the freezing point, the molecules speed up and the ice melts to liquid water.

Only a small percentage of Earth's water is drinkable – the rest is salty ocean water. Salinity affects the freezing temperature of ocean water. The salt inhibits the formation of ice crystals at 0°C – ocean water freezes at -1.9°C. Salinity also affects the density of water – ocean water is more dense than fresh water and is more buoyant than freshwater.

Precipitation soaks into the ground and becomes groundwater. When water cannot move down any further, it fills the spaces in the permeable rock and forms a saturated zone. The top of this zone is known as the water table. Groundwater supplies people with fresh drinking water.

Ocean water contains gases such as carbon dioxide and oxygen. There is about 60 times more carbon dioxide in ocean water than in the air. In contrast, there is less oxygen in ocean water than in air – oxygen dissolves in the ocean water. Cold water holds more oxygen than warm water.

The movement of Earth's plates causes powerful forces that squeeze or pull rock in the crust. Three different kinds of stress occur: shearing, tension, and compression. Shearing pushes a mass of rock in two opposite directions causing the rock to break and slip apart, or change shape. Tension pulls on the crust, stretching rock so that it becomes thinner in the middle, and occurs where two plates are moving apart. Compression is a stress force that squeezes rock until it folds or breaks. The collision of two plates can also cause compression and form mountain ranges, such as the Himalayas and the Alps.

Weathering is the process that breaks down rocks and can be mechanical (caused by freezing, thawing, abrasion, release of pressure, growth of plants, actions of animals) or chemical (caused by water, oxygen, carbon dioxide, living organisms, acid rain). Both types of weathering occur faster in wet climates than in dry climates, and chemical weathering occurs faster at higher temperatures.

There are seven types of soil in North America. Tundra soils are thin soils that form in cold climates and contain little humus. Prairie soils form in cool, dry grassland climates and contain a thick topsoil rich in humus. Mountain soils have thin topsoil as a result of cold temperatures and erosion. Southern forest soils form in warm, wet, climates and have little humus. Desert soils are sandy and low in humus. Tropical soils form in wet, tropical climates and often are low in humus and minerals.

Diamonds are one of the most precious minerals on Earth and are found on every continent. The formation of diamonds occurs under tremendous temperatures and pressures deep inside Earth. They are formed in the mantle at depths of more than 186 miles (300 km). The diamonds are brought toward the surface by magma in explosive eruptions. These eruptions form narrow carrot-shaped pipe called kimberlites. Diamonds are either mined directly

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from the kimberlites or from deposits that form from the erosion of the pipes.

The Milky Way Galaxy has about 200-400 billion stars, including our sun, and a diameter of about 100,000 light-years. A light-year is the distance that light travels in one year (about 9.5 trillion kilometers). Our solar system is located inside of one of the Milky Way's spiral arms, about 25,000 light-years from the galaxy's center.

The four inner planets are called terrestrial planets with structures similar to Earth's – small and dense with rocky surfaces. Like Earth, they have a crust, mantle, and core. Earth is the only planet in the solar system capable of supporting life. The liquid water at its surface, and the oxygen and nitrogen in its atmosphere provide organisms with some materials they need to live.

Unlike the terrestrial planets, the outer planets do not have solid surfaces. They are mostly liquid hydrogen and helium, and have cores of metal rock. Because they are so far from the sun, they are very cold. The gravitational force on these planets is so strong that the gases in their atmospheres cannot escape, so their atmospheres are very thick. Other objects in the solar system are asteroids (rocky objects that revolve around the sun in the asteroid belt), comets (pieces of rock and ice that originate in areas beyond Pluto), meteoroids (chunks that break off of asteroids). Meteoroids that enter Earth's atmosphere are called meteors and those that hit Earth's surface are called meteorites.

**Primary interdisciplinary connections: Reading, Math, Social Studies, Language Arts, Writing, 21<sup>st</sup> century themes:**

- **Creativity and Innovation**
  - Think Creatively
  - Work Creatively with Others
  - Implement Innovations
- **Critical Thinking and Problem Solving**
  - Reason Effectively
  - Use Systems Thinking
  - Make Judgments and Decisions
  - Solve Problems
- **Communication and Collaboration**
  - Communicate Clearly
  - Collaborate with Others

**Standard(s)**

- **5-ESS1 Earth's Place in the Universe**
- **5-ESS2 Earth's Systems**
- **5-ESS3 Earth and Human Activity**
- 

**Performance Expectations**

- **5-ESS1-1 Support an argument that differences in the apparent brightness of the sun compared to other stars is due to their relative distances from the Earth.**

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- **5-ESS1-2 Represent data in graphical displays to reveal patterns of daily changes in length and direction of shadows, day and night, and the seasonal appearance of some stars in the night sky.**
- **5-ESS2-1 Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and /or atmosphere interact.**
- **5-ESS2-2 Describe and graph the amounts and percentages of water and fresh water in various reservoirs to provide evidence about the distribution of water on Earth.**
- **5-ESS3-1 Obtain and combine information about ways individual communities use science ideas to protect the Earth’s resources and environment.**

### Science and Engineering Practices

#### **Analyzing and Interpreting Data**

- Analyzing data in 3-5 builds on K-2 experiences and progresses to introducing quantitative approaches to collecting data and conducting multiple trials of qualitative observations. When possible and feasible, digital tools should be used.

#### **Engaging in Argument from Evidence**

- Engaging in argument from evidence in 3-5 build on K-2 experiences and progresses to critiquing the scientific explanations or solutions proposed by peers by citing relevant evidence about the natural and designed world(s).

#### **Developing and Using Models**

- Modeling in 3-5 builds on K-2 experiences and progresses to building and revising simple models and using models to represent events and design solutions.

#### **Using Mathematics and Computational Thinking**

- Mathematical and computational thinking in 3-5 builds on K-2 experiences and progresses to extending quantitative measurements to a variety of physical properties and using computation and mathematics to analyze data and compare alternative design solutions.

#### **Obtaining, Evaluating, and Communicating Information**

- Obtaining, evaluating, and communicating information in 3-5 builds on K-2 experiences and progresses to evaluating the merit and accuracy of ideas and methods.

### **Disciplinary Core Ideas**

- **ESS1.A: The Universe and its Stars**
- **ESS1.B: Earth and the Solar System**
- **ESS2.A: Earth Materials and Systems**
- **ESS2.C: The Roles of Water in Earth’s Surface Processes**
- **ESS3.C: Human Impacts on Earth Systems**

### **Crosscutting Concepts**

- **Patterns**
- **Scale, Proportion, and Quantity**
- **Systems and System Models**
- **Science Addresses Questions About the Natural and Material World**

### **Performance Expectations (PE)**

### **Supporting Concepts, Practices, and Ideas**

5-ESS1-1

Support an argument with evidence, data, or a model.

The sun is a star that appears larger and brighter than other stars because it is closer. Stars range greatly in their distance from Earth.

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	Natural objects exist from the very small to the immensely large.
5-ESS1-2	Represent data in graphical displays (bar graphs, pictographs, and/or pie charts) to reveal patterns that indicate relationships.
	The orbits of Earth around the sun and of the moon around Earth, together with the rotation of Earth about an axis between its North and South poles, cause observable patterns. These include day and night; daily changes in the length and direction of shadows; and different positions of the sun, moon, and stars at different times of the day, month, and year.
	Similarities and differences in patterns can be used to sort, classify, communicate and analyze simple rates of change for natural phenomena.
5-ESS2-1	Develop a model using an example to describe a scientific principle.
	Earth's major systems are the geosphere (solid and molten rock, soil, and sediments), the hydrosphere (water and ice), the atmosphere (air), and the biosphere (living things, including humans). These systems interact in multiple ways to affect Earth's surface materials and processes. The ocean supports a variety of ecosystems and organisms, shapes landforms, and influences climate. Winds and clouds in the atmosphere interact with the landforms to determine patterns of weather.
	A system can be described in terms of its components and their interactions.
5-ESS2-2	Describe and graph quantities such as area and volume to address scientific questions.
	Nearly all of Earth's available water is in the ocean. Most fresh water is in glaciers or underground; only a tiny fraction is in streams, lakes, wetlands, and the atmosphere.
	Standard units are used to measure and describe physical quantities such as weight and volume.
5-ESS3-1	Obtain and combine information from books and/or other reliable media to explain phenomena or solutions to a design problem.
	Human activities in agriculture, industry, and everyday life have had major effects on the land, vegetation, streams, ocean, air, and even outer space. But individuals and communities are doing things to help protect Earth's resources and environments.
	A system can be described in terms of its components and their interactions.
	Science findings are limited to questions that can be answered with empirical evidence.
<b>Related Common Core ELA Standards</b>	
RI.5.1	Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text. (5-ESS1-1) (5-ESS3-1)
RI.5.7	Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently. (5-ESS1-1) (5-ESS2-1) (5-ESS2-2) (5-ESS3-1)

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RI.5.8	Explain how an author uses reasons and evidence to support particular points in a text, identifying which reasons and evidence support which point(s). (5-ESS1-1)		
RI.5.9	Integrate information from several texts on the same topic in order to write or speak about the subject knowledgeably. (5-ESS3-1)		
W.5.1	Write opinion pieces on topics or texts, supporting a point of view with reasons and information. (5-ESS1-1)		
W.5.8	Recall relevant information from experiences or gather relevant information from print and digital sources; summarize or paraphrase information in notes and finished work, and provide a list of sources. (5-ESS2-2) (5-ESS3-1)		
W.5.9	Draw evidence from literary or informational texts to support analysis, reflection, and research. (5-ESS3-1)		
SL.5.5	Include multimedia components (e.g., graphics, sound) and visual displays in presentations when appropriate to enhance the development of main ideas or themes. (5-ESS1-2) (5-ESS2-1) (5-ESS2-2)		
<b>Related Common Core Mathematics Standards</b>			
MP.2	Reason abstractly and quantitatively. (5-ESS1-1) (5-ESS1-2) (5-ESS2-1) (5-ESS2-2) (5-ESS3-1)		
MP.4	Model with mathematics. (5-ESS1-1) (5-ESS1-2) (5-ESS2-1) (5-ESS2-2) (5-ESS3-1)		
5.NBT.A.2	Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10. (5-ESS1-1)		
5.G.A.2	Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation. (5-ESS1-2) (5-ESS2-1)		
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- *What are the outer planets?*
- *What are asteroids, meteors, comets, and moons?*

- Sun, Earth, Moon system occur because of gravitational interaction and energy from the Sun.
- Physical characteristics of planets depend on their distance from the Sun and their size.
- The Sun is star.
- The universe is composed of galaxies, each of which is composed of solar systems having the same elements and governed by the same laws.
- Earth systems can be broken down into individual components that have observable measurable properties.
- Earth's components form systems. These systems continually interact at different rates of time affecting the Earth regionally and globally.
- Technology enables us to better understand Earth's systems and the impact of Earth's systems on human activity.

### Unit Learning Targets

*Students will be Able To:*

- understand that water changes between the solid, liquid, and gas states
- recognize that the ocean is a major reservoir in Earth's water cycle
- describe the factors that determine weather
- explain that there are different types of precipitation and each is connected with other weather conditions
- explain that different climate zones have specific characteristics
- describe how to identify common minerals and explain the uses of some minerals
- explain how to identify rocks and describe the uses of some rocks
- describe the parts that make up soil
- explain how erosion and deposition can change Earth's surface
- describe how forces change Earth's surface
- describe renewable, nonrenewable, and inexhaustible energy resources
- demonstrate an understanding of some pollutants in water, air, and soil
- describe how Earth rotates and revolves
- understand why the sun, moon, and stars appear to move across the sky
- describe the physical characteristics of the sun
- understand why Polaris is important
- identify the outer planets, inner planets, and Earth's position in the solar system
- describe how technology has helped people explore space
- identify Jupiter, Saturn, Uranus, and Neptune
- describe their common characteristics
- understand the difference between moons, asteroids, comets, meteoroids, meteors, and meteorites

### Unit Vocabulary:

- **Chapter 7: barometric pressure, circulation, climate, condensation, elevation, evaporation, hail, humidity, hydrosphere, latitude, precipitation, reservoir, sleet, water cycle, weather**

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- **Chapter 8:** *constructive forces, destructive forces, deposition, erosion, humus, igneous, inexhaustible resource, inorganic matter, metamorphic, mineral, nonrenewable resource, organic matter, pollutant, plate, renewable resource, rock cycle, sedimentary, soil, weathering*
- **Chapter 9:** *asteroid, axis, comet, constellation, dwarf planet, inner planet, moon, orbit, outer planet, planet, revolution, solar flare, space probe*

### Evidence of Learning

**Summative Assessments at the end of each chapter.**

**Equipment needed:** See teacher's edition

**Teacher Resources:** Pearson Interactive Science

<https://www.pearsonsuccessnet.com/snapp/login/PsnLandingPage.jsp?showLandingPage=true&ticket=ST-1368125-E9Ki92wc0g5CVII9xxk5-b3-rumba-prod-01-01>

### Formative Assessments

- |   |                                       |
|---|---------------------------------------|
| ● teacher observation                         | ● student interactive science journal |
| ● student responses to questions              | ●                                     |
| ● student participation in inquiry activities | ●                                     |

### Lesson Plans

<b>Chapter 7: <i>The Water Cycle and Weather</i></b>	<b>Timeframe</b>
Lesson 1 <i>What is the Water Cycle?</i>	<b>3-4 class periods</b>
Lesson 2 <i>What is the Ocean?</i>	<b>3-4 class periods</b>
Lesson 3 <i>What is Weather?</i>	<b>3-4 class periods</b>
Lesson 4 <i>How Do Clouds and Precipitation Form?</i>	<b>3-4 class periods</b>
Lesson 5 <i>What is Climate</i>	<b>3-4 class periods</b>

### Inquiry Questions and Labs:

- *How can water move in the water cycle?*
- *Where is the hurricane going?*
- *How accurately can the path of a hurricane be predicted?*
- **At-Home Lab: Watering Can**
- *What can happen when salt water evaporates?*
- **At-Home Lab: Running Hot and Cold**
- *Does a cloud form?*
- **At-Home Lab: Rainmaker**
- *How does a thermometer work?*
- **Lightning Lab: Climate Zones**

<b>Chapter 8: <i>Earth's Surface</i></b>	<b>Timeframe</b>
Lesson 1	<b>3-4 class periods</b>

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<i>What Are Minerals?</i>	
Lesson 2 <i>What Are Rocks?</i>	<b>3-4 class periods</b>
Lesson 3 <i>What Makes Up Soil?</i>	<b>3-4 class periods</b>
Lesson 4 <i>What Are Erosion and Deposition?</i>	<b>3-4 class periods</b>
Lesson 5 <i>How Does Earth's Surface Change?</i>	<b>3-4 class periods</b>
Lesson 6 <i>What Are Some Energy Resources?</i>	<b>3-4 class periods</b>
Lesson 7 <i>What is Pollution?</i>	<b>3-4 class periods</b>
<b>Inquiry Questions and Labs:</b> <ul style="list-style-type: none"> <li>● <i>How are minerals alike and different?</i></li> <li>● <i>What are some properties of minerals?</i></li> <li>● <i>How can you make an expanded table of diagnostic properties?</i></li> <li>● <i>What do mineral crystals look like?</i></li> <li>● <b>At-Home Lab: Mineral Search</b></li> <li>● <i>What causes some rocks to float?</i></li> <li>● <b>At-Home Lab: Rock It</b></li> <li>● <i>What are the parts of soil?</i></li> <li>● <b>At-Home Lab: Soil Survey</b></li> <li>● <i>How does melting ice cause erosion?</i></li> <li>● <b>Go Green: Blown Over</b></li> <li>● <i>How do forces affect Earth's surface?</i></li> <li>● <b>Lightning Lab: Model Forces</b></li> <li>● <b>Go Green: Compost It!</b></li> <li>● <i>How can pollution affect water?</i></li> <li>● <b>Go Green: Reducing Pollution</b></li> </ul>	
<b>Chapter 9: Earth and Space</b>	<b>Timeframe</b>
Lesson 1 <i>How Does Earth Move?</i>	<b>3-4 class periods</b>
Lesson 2 <i>What Is A Star?</i>	<b>3-4 class periods</b>
Lesson 3 <i>What Are the Inner Planets?</i>	<b>3-4 class periods</b>
Lesson 4 <i>What Are the Outer Planets?</i>	<b>3-4 class periods</b>
Lesson 5 <i>What Are Asteroids, Meteors, Comets, and Moons?</i>	<b>3-4 class periods</b>
<b>Inquiry Questions and Labs:</b>	

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- *What does a spiral galaxy look like from different angles?*
- *How can spinning affect a planet's shape?*
- *How does the speed that a planet spins affect its shape?*
- *How does sunlight strike Earth's surface?*
- **Lightning Lab: Day and Night**
- **Lightning Lab: Measuring Shadows**
- *How does distance affect orbiting time?*
- **Lightning Lab: Model Planets**
- *How are the sizes of the inner and outer planets different?*
- **Lightning Lab: Reading in the Dark**
- *How does a meteoroid fall through Earth's atmosphere?*
- **At-Home Lab: Meteor Shower**

**Teacher Notes:**

### Curriculum Development Resources

Click the links below to access additional resources used to design this unit:

- **Next Generation Science Standards (NGSS)** <http://www.nextgenscience.org/>
- **21<sup>st</sup> Century Skills** <http://www.p21.org/our-work/p21-framework>
- **New Jersey Standards Clarification Project**  
<http://www.nj.gov/education/aps/njscp/Phase1allAreas.pdf>

## The Water Cycle and Weather: Lesson 1

**Content Area: Science**

**Lesson Title:** *What is the Water Cycle?*

**Timeframe:** 3-4 class periods

### Lesson Components

**\*[21<sup>st</sup> Century Themes](#)**

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	Global Awareness		Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy		Health Literacy
<b><u>*21<sup>st</sup> Century Skills</u></b>							
x	Creativity and Innovation	x	Critical Thinking and Problem Solving	x	Communication and Collaboration	x	Information Literacy
	Media Literacy		ICT Literacy	x	Life and Career Skills		
<b>*Interdisciplinary Connections: see unit overview</b>							
<b>*Integration of Technology: Pearson Interactive Science Program</b>							
<b>*Equipment needed: see teacher's edition</b>							
<b>*Vocabulary: see unit overview for all vocabulary associated with this unit</b>							

Learning Outcomes	Learning Activities/Instructional Strategies
<p>Students Will Be Able To:</p> <ul style="list-style-type: none"> <li>● understand that water changes between the solid, liquid, and gas states</li> </ul>	<p><b>Lesson Sequence</b></p> <ol style="list-style-type: none"> <li>1. <b>Engage:</b> <ol style="list-style-type: none"> <li>a. Students explain how it is possible to see a lion's breath.</li> <li>b. Introduce lesson vocabulary.</li> </ol> </li> <li>2. <b>Explore: My Planet Diary Connections</b></li> <li>3. <b>Explain:</b> <ol style="list-style-type: none"> <li>a. Review lesson question.</li> <li>b. Students read <i>Water in the Air</i>, <i>The Water Cycle</i>, and <i>Energy in the Water Cycle</i> then answer questions using reading strategies.</li> </ol> </li> <li>4. <b>At-Home Lab: Watering Can</b> <ol style="list-style-type: none"> <li>a. Students test and describe how condensation forms on the outside of a can.</li> </ol> </li> <li>5. <b>Math Connection</b> <ol style="list-style-type: none"> <li>a. Students estimate the area of a lake.</li> </ol> </li> <li>6. <b>Elaborate:</b> <ol style="list-style-type: none"> <li>a. <b>Science Notebook:</b> Students make a drawing of how the water cycle works.</li> </ol> </li> <li>7. <b>Evaluate:</b> <ol style="list-style-type: none"> <li>a. Review lesson vocabulary</li> <li>b. Students complete the Lesson Check blackline master to determine whether they need additional help with lesson content.</li> </ol> </li> </ol>

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### Differentiation:

Embedded in the program are

- strategies for English Language Learners
- leveled readers
- resources to address multiple intelligences

**Resources Provided:** *Pearson Interactive Science*

### The Water Cycle and Weather: Lesson 2

**Content Area:** Science

**Lesson Title:** *What is the Ocean?*

**Timeframe:** 3-4 class periods

#### Lesson Components

#### \*21<sup>st</sup> Century Themes

Global Awareness	Financial, Economic, Business, and Entrepreneurial Literacy	Civic Literacy	Health Literacy
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#### \*21<sup>st</sup> Century Skills

x	Creativity and Innovation	x	Critical Thinking and Problem Solving	x	Communication and Collaboration	x	Information Literacy
	Media Literacy		ICT Literacy	x	Life and Career Skills		

**\*Interdisciplinary Connections:** see unit overview

**\*Integration of Technology:** Pearson Interactive Science Program

**\*Equipment needed:** see teacher's edition

**\*Vocabulary:** see unit overview for all vocabulary associated with this unit

Learning Outcomes	Learning Activities/Instructional Strategies
<p>Students Will Be Able To:</p> <ul style="list-style-type: none"> <li>• recognize that the ocean is a major reservoir in Earth's water cycle</li> </ul>	<p><b>Lesson Sequence</b></p> <ol style="list-style-type: none"> <li>1. <b>Engage:</b> <ol style="list-style-type: none"> <li>a. Students describe differences between land and oceans on a map.</li> <li>b. Introduce lesson vocabulary.</li> </ol> </li> <li>2. <b>Explore It! <i>What can happen when salt water evaporates?</i></b></li> </ol>

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	<ol style="list-style-type: none"><li>3. <b>Explain:</b><ol style="list-style-type: none"><li>a. Review lesson question.</li><li>b. Students read <i>The Hydrosphere, Ocean Temperature and Circulation</i>, and <i>Ocean Resources</i> then answer questions using reading strategies.</li></ol></li><li>4. <b>At-Home Lab: <i>Getting Frosted</i></b><ol style="list-style-type: none"><li>a. Students observe an empty glass after being in the freezer for 30 minutes.</li></ol></li><li>5. <b>Elaborate:</b><ol style="list-style-type: none"><li>a. <b>Science Notebook:</b> Students write about how differences in salinity and temperature can cause ocean currents.</li></ol></li><li>6. <b>Evaluate:</b><ol style="list-style-type: none"><li>a. Review lesson vocabulary</li><li>c. Students complete the Lesson Check blackline master to determine whether they need additional help with lesson content.</li></ol></li></ol>
<p><b>Differentiation:</b> Embedded in the program are</p> <ul style="list-style-type: none"><li>● strategies for English Language Learners</li><li>● leveled readers</li><li>● resources to address multiple intelligences</li></ul>	
<p><b>Resources Provided:</b> <i>Pearson Interactive Science</i></p>	

### The Water Cycle and Weather: Lesson 3

**Content Area:** Science

**Lesson Title:** *What is Weather?*

**Timeframe:** 3-4 class periods

#### Lesson Components

**\*21<sup>st</sup> Century Themes**

Created for New Jersey school districts through a project of the New Jersey Department of Education, Office of Academic Standards, in partnership with the N.J. Association for Supervision and Curriculum Development and the N.J. Principals and Supervisors Association.

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	Global Awareness		Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy		Health Literacy
<b><u>*21<sup>st</sup> Century Skills</u></b>							
x	Creativity and Innovation	x	Critical Thinking and Problem Solving	x	Communication and Collaboration		Information Literacy
	Media Literacy		ICT Literacy	x	Life and Career Skills		
<b>*Interdisciplinary Connections: see unit overview</b>							
<b>*Integration of Technology: Pearson Interactive Science Program</b>							
<b>*Equipment needed: see teacher's edition</b>							
<b>*Vocabulary: see unit overview for all vocabulary associated with this unit</b>							

Learning Outcomes	Learning Activities/Instructional Strategies
<p>Students Will Be Able To:</p> <ul style="list-style-type: none"> <li>● describe the factors that determine weather</li> </ul>	<p><b>Lesson Sequence</b></p> <ol style="list-style-type: none"> <li>1. <b>Engage:</b> <ol style="list-style-type: none"> <li>a. Students circle an area on a map where they might find clear skies.</li> <li>b. Introduce lesson vocabulary.</li> </ol> </li> <li>2. <b>Explore It! <i>How accurate are weather forecasts?</i></b></li> <li>3. <b>Explain:</b> <ol style="list-style-type: none"> <li>a. Review lesson question.</li> <li>b. Students read <i>Weather and Circulation</i> then answer questions using reading strategies.</li> </ol> </li> <li>4. <b>Math Connection</b> <ol style="list-style-type: none"> <li>a. Students answer questions about a line graph that shows the average monthly high temperatures in Fort Lauderdale.</li> </ol> </li> <li>5. <b>At-Home Lab: <i>Running Hot and Cold</i></b> <ol style="list-style-type: none"> <li>a. Students use hot and cold water to examine humidity.</li> </ol> </li> <li>6. <b>Elaborate:</b> <ol style="list-style-type: none"> <li>a. <b>Science Notebook:</b> Students draw a diagram of a simple mercury barometer and predict whether the fluid would rise or lower in the tube if it were under higher pressure than it is shown in their drawing.</li> </ol> </li> <li>7. <b>Evaluate:</b> <ol style="list-style-type: none"> <li>a. Review lesson vocabulary</li> <li>b. Students complete the Lesson Check blackline master to determine whether they need</li> </ol> </li> </ol>



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	additional help with lesson content.
<b>Differentiation:</b> Embedded in the program are <ul style="list-style-type: none"> <li>• strategies for English Language Learners</li> <li>• leveled readers</li> <li>• resources to address multiple intelligences</li> </ul>	
<b>Resources Provided:</b> <i>Pearson Interactive Science</i>	

The Water Cycle and Weather: Lesson 4					
<b>Content Area: Science</b>					
<b>Lesson Title:</b> <i>How Do Clouds and Precipitation Form?</i>				<b>Timeframe:</b> 3-4 class periods	
Lesson Components					
<u><b>*21<sup>st</sup> Century Themes</b></u>					
	Global Awareness		Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy
					Health Literacy
<u><b>*21<sup>st</sup> Century Skills</b></u>					
x	Creativity and Innovation	x	Critical Thinking and Problem Solving	X	Communication and Collaboration
					Information Literacy
	Media Literacy		ICT Literacy	X	Life and Career Skills
<b>*Interdisciplinary Connections:</b> see unit overview					
<b>*Integration of Technology:</b> Pearson Interactive Science Program					
<b>*Equipment needed:</b> see teacher's edition					
<b>*Vocabulary:</b> see unit overview for all vocabulary associated with this unit					

Learning Outcomes	Learning Activities/Instructional Strategies
Students Will Be Able To: <ul style="list-style-type: none"> <li>• explain that there are different types of precipitation and each is connected with</li> </ul>	<b>Lesson Sequence</b> <ol style="list-style-type: none"> <li>1. <b>Engage:</b> <ol style="list-style-type: none"> <li>a. Students identify a six-pointed snowflake.</li> </ol> </li> </ol>

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<p>other weather conditions</p>	<p>b. Introduce lesson vocabulary.</p> <p>2. <b>Explore It! <i>Does a Cloud Form?</i></b></p> <p>3. <b>Explain:</b></p> <p style="margin-left: 20px;">a. Review lesson question.</p> <p style="margin-left: 20px;">b. Students read <i>Water in the Air, Precipitation, and Types of Clouds</i> then answer questions using reading strategies.</p> <p>4. <b>At-Home Lab: <i>Rainmaker</i></b></p> <p style="margin-left: 20px;">a. Students spray the inside of a lid with water until droplets form and use a toothpick to push the smaller drops together to understand how rain forms.</p> <p>5. <b>Elaborate:</b></p> <p style="margin-left: 20px;">a. Students learn the meaning of the Latin word <i>cirrus</i> and discuss why it is an accurate description of cirrus clouds.</p> <p style="margin-left: 20px;">b. Students use a dictionary to find the origin and meaning of <i>altocumulus</i> and <i>stratus</i>.</p> <p>6. <b>Evaluate:</b></p> <p style="margin-left: 20px;">a. Review lesson vocabulary</p> <p style="margin-left: 20px;">b. Students complete the Lesson Check blackline master to determine whether they need additional help with lesson content.</p>
<p><b>Differentiation:</b>                  Embedded in the program are</p> <ul style="list-style-type: none"> <li>● strategies for English Language Learners</li> <li>● leveled readers</li> <li>● resources to address multiple intelligences</li> </ul>	
<p><b>Resources Provided:</b> <i>Pearson Interactive Science</i></p>	

<b>The Water Cycle and Weather: Lesson 5</b>	
<b>Content Area: Science</b>	
<b>Lesson Title:</b> <i>What is Climate?</i>	<b>Timeframe:</b> 3-4 class periods
<b>Lesson Components</b>	

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<u><b>*21<sup>st</sup> Century Themes</b></u>					
	Global Awareness		Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy
					Health Literacy
<u><b>*21<sup>st</sup> Century Skills</b></u>					
x	Creativity and Innovation	x	Critical Thinking and Problem Solving	X	Communication and Collaboration
					Information Literacy
	Media Literacy		ICT Literacy	x	Life and Career Skills
<b>*Interdisciplinary Connections: see unit overview</b>					
<b>*Integration of Technology: Pearson Interactive Science Program</b>					
<b>*Equipment needed: see teacher's edition</b>					
<b>*Vocabulary: see unit overview for all vocabulary associated with this unit</b>					

Learning Outcomes	Learning Activities/Instructional Strategies
<p>Students Will Be Able To:</p> <ul style="list-style-type: none"> <li>● explain that different climate zones have specific characteristics</li> </ul>	<p><b>Lesson Sequence</b></p> <ol style="list-style-type: none"> <li>1. <b>Engage:</b> <ol style="list-style-type: none"> <li>a. Students discuss what they think a seaside climate is like.</li> <li>b. Introduce lesson vocabulary.</li> </ol> </li> <li>2. <b>Explore It! <i>How does a thermometer work?</i></b></li> <li>3. <b>Explain:</b> <ol style="list-style-type: none"> <li>a. Review lesson question.</li> <li>b. Students read <i>Average Weather</i> and <i>Factors That Affect Climate</i> then answer questions using reading strategies.</li> </ol> </li> <li>4. <b>Lightning Lab: <i>Climate Zones</i></b> <ol style="list-style-type: none"> <li>a. Students discuss if they would expect a city with the same latitude as their own to have a similar climate.</li> </ol> </li> <li>5. <b>Elaborate:</b> <ol style="list-style-type: none"> <li>a. Discuss the history of the word <i>climate</i>; students list ways that they think a word meaning “region” might relate to the definition of <i>climate</i>.</li> </ol> </li> <li>6. <b>Evaluate:</b> <ol style="list-style-type: none"> <li>a. Review lesson vocabulary</li> <li>b. Students complete the Lesson Check blackline master to determine whether they need</li> </ol> </li> </ol>

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	additional help with lesson content.
<b>Differentiation:</b> Embedded in the program are <ul style="list-style-type: none"> <li>• strategies for English Language Learners</li> <li>• leveled readers</li> <li>• resources to address multiple intelligences</li> </ul>	
<b>Resources Provided:</b> <i>Pearson Interactive Science</i>	

Earth's Surface: Lesson 1					
<b>Content Area: Science</b>					
<b>Lesson Title:</b> <i>What Are Minerals?</i>				<b>Timeframe:</b> 3-4 class periods	
Lesson Components					
<b>*<u>21<sup>st</sup> Century Themes</u></b>					
	Global Awareness		Financial, Economic, Business, and Entrepreneurial Literacy	Civic Literacy	Health Literacy
<b>*<u>21<sup>st</sup> Century Skills</u></b>					
x	Creativity and Innovation	x	Critical Thinking and Problem Solving	x	Communication and Collaboration
	Media Literacy		ICT Literacy	x	Life and Career Skills
* <b>Interdisciplinary Connections:</b> see unit overview					
* <b>Integration of Technology:</b> Pearson Interactive Science Program					
* <b>Equipment needed:</b> see teacher's edition					
* <b>Vocabulary:</b> see unit overview for all vocabulary associated with this unit					

Learning Outcomes	Learning Activities/Instructional Strategies
Students Will Be Able To: <ul style="list-style-type: none"> <li>• describe how to identify common minerals and explain the uses of some minerals</li> </ul>	<b>Lesson Sequence</b> <ol style="list-style-type: none"> <li>1. <b>Engage:</b> <ol style="list-style-type: none"> <li>a. Students find and identify the mineral properties of a diamond.</li> <li>b. Introduce lesson vocabulary.</li> </ol> </li> <li>2. <b>Explore It! <i>What do mineral crystals look like?</i></b></li> <li>3. <b>Explain:</b> <ol style="list-style-type: none"> <li>a. Review lesson question.</li> </ol> </li> </ol>

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	<ul style="list-style-type: none"> <li>b. Students read <i>Minerals, Properties of Minerals, Identifying Minerals, and Economic Significance</i> then answer questions using reading strategies.</li> <li>4. <b>At-Home Lab: Mineral Search</b> <ul style="list-style-type: none"> <li>a. Students find and identify minerals within some objects in their homes.</li> </ul> </li> <li>5. <b>Elaborate:</b> <ul style="list-style-type: none"> <li>a. <b>Science Notebook:</b> Students list and define some science-related words that use the suffix <i>-ness</i>.</li> </ul> </li> <li>6. <b>Evaluate:</b> <ul style="list-style-type: none"> <li>a. Review lesson vocabulary</li> <li>b. Students complete the Lesson Check blackline master to determine whether they need additional help with lesson content.</li> </ul> </li> </ul>
<p><b>Differentiation:</b> Embedded in the program are</p> <ul style="list-style-type: none"> <li>• strategies for English Language Learners</li> <li>• leveled readers</li> <li>• resources to address multiple intelligences</li> </ul>	
<p><b>Resources Provided:</b> <i>Pearson Interactive Science</i></p>	

<b>Earth's Surface: Lesson 2</b>							
<b>Content Area: Science</b>							
<b>Lesson Title:</b> <i>What Are Rocks?</i>				<b>Timeframe:</b> 3-4 class periods			
<b>Lesson Components</b>							
<b><u>*21<sup>st</sup> Century Themes</u></b>							
	Global Awareness		Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy		Health Literacy
<b><u>*21<sup>st</sup> Century Skills</u></b>							
x	Creativity and Innovation	X	Critical Thinking and Problem Solving	x	Communication and Collaboration		Information Literacy

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Media Literacy	ICT Literacy	x	Life and Career Skills
<b>*Interdisciplinary Connections: see unit overview</b>			
<b>*Integration of Technology: Pearson Interactive Science Program</b>			
<b>*Equipment needed: see teacher's edition</b>			
<b>*Vocabulary: see unit overview for all vocabulary associated with this unit</b>			

Learning Outcomes	Learning Activities/Instructional Strategies
<p>Students Will Be Able To:</p> <ul style="list-style-type: none"> <li>● explain how to identify rocks and describe the uses of some rocks</li> </ul>	<p><b>Lesson Sequence</b></p> <ol style="list-style-type: none"> <li>1. <b>Engage:</b> <ol style="list-style-type: none"> <li>a. Students describe some visible properties of rocks.</li> <li>b. Introduce lesson vocabulary.</li> </ol> </li> <li>2. <b>Explore It! <i>What causes some rocks to float?</i></b></li> <li>3. <b>Explain:</b> <ol style="list-style-type: none"> <li>a. Review lesson question.</li> <li>b. Students read <i>Kinds of Rocks</i>, <i>The Rock Cycle</i>, <i>Identifying Rocks</i>, and <i>Economic Significance</i> then answer questions using reading strategies.</li> </ol> </li> <li>4. <b>At-Home Lab: <i>Rock It</i></b> <ol style="list-style-type: none"> <li>a. Students write a “rock” song that describes what igneous, sedimentary, and metamorphic rocks are made of.</li> </ol> </li> <li>5. <b>Elaborate:</b> <ol style="list-style-type: none"> <li>a. <b>Science Notebook:</b> Students write about how rocks can change from one form to another.</li> </ol> </li> <li>6. <b>Evaluate:</b> <ol style="list-style-type: none"> <li>a. Review lesson vocabulary</li> <li>b. Students complete the Lesson Check blackline master to determine whether they need additional help with lesson content.</li> </ol> </li> </ol>
<p><b>Differentiation:</b></p> <p>Embedded in the program are</p> <ul style="list-style-type: none"> <li>● strategies for English Language Learners</li> <li>● leveled readers</li> <li>● resources to address multiple intelligences</li> </ul>	
<p><b>Resources Provided:</b> <i>Pearson Interactive Science</i></p>	

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Earth's Surface: Lesson 3					
<b>Content Area: Science</b>					
<b>Lesson Title:</b> <i>What Makes Up Soil?</i>				<b>Timeframe:</b> 3-4 class periods	
Lesson Components					
<u>*21<sup>st</sup> Century Themes</u>					
	Global Awareness		Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy
					Health Literacy
<u>*21<sup>st</sup> Century Skills</u>					
x	Creativity and Innovation	x	Critical Thinking and Problem Solving	x	Communication and Collaboration
	Media Literacy		ICT Literacy	x	Life and Career Skills
<b>*Interdisciplinary Connections:</b> see unit overview					
<b>*Integration of Technology:</b> Pearson Interactive Science Program					
<b>*Equipment needed:</b> see teacher's edition					
<b>*Vocabulary:</b> see unit overview for all vocabulary associated with this unit					

Learning Outcomes	Learning Activities/Instructional Strategies
Students Will Be Able To: <ul style="list-style-type: none"> <li>● describe the parts that make up soil</li> </ul>	<b>Lesson Sequence</b> <ol style="list-style-type: none"> <li>1. <b>Engage:</b> <ol style="list-style-type: none"> <li>a. Students discuss how they think soil is formed.</li> <li>b. Introduce lesson vocabulary.</li> </ol> </li> <li>2. <b>Explore It! <i>What are the parts of soil?</i></b></li> <li>3. <b>Explain:</b> <ol style="list-style-type: none"> <li>a. Review lesson question.</li> <li>b. Students read <i>Soil Formation, Parts of Soil, Kinds of Soil,</i> and <i>Factors That Affect Soil</i> then answer questions using reading strategies.</li> </ol> </li> <li>4. <b>At-Home Lab: <i>Soil Survey</i></b> <ol style="list-style-type: none"> <li>a. Students walk around outside and make a chart based on the soil they observed.</li> </ol> </li> <li>5. <b>Elaborate:</b> <ol style="list-style-type: none"> <li>a. <b>Science Notebook:</b> Students write a sentence using the word <i>humus</i> in a way that describes its function as part of soil.</li> </ol> </li> </ol>

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	<p>6. <b>Evaluate:</b></p> <ul style="list-style-type: none"> <li>a. Review lesson vocabulary</li> <li>b. Students complete the Lesson Check blackline master to determine whether they need additional help with lesson content.</li> </ul>
<p><b>Differentiation:</b>                  Embedded in the program are</p> <ul style="list-style-type: none"> <li>• strategies for English Language Learners</li> <li>• leveled readers</li> <li>• resources to address multiple intelligences</li> </ul>	
<p><b>Resources Provided:</b> <i>Pearson Interactive Science</i></p>	

Earth's Surface: Lesson 4					
<b>Content Area: Science</b>					
<b>Lesson Title:</b> <i>What Are Erosion and Deposition?</i>				<b>Timeframe:</b> 3-4 class periods	
Lesson Components					
<u>*21<sup>st</sup> Century Themes</u>					
	Global Awareness		Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy
					Health Literacy
<u>*21<sup>st</sup> Century Skills</u>					
x	Creativity and Innovation	x	Critical Thinking and Problem Solving	x	Communication and Collaboration
	Media Literacy		ICT Literacy	x	Life and Career Skills
<b>*Interdisciplinary Connections: see unit overview</b>					
<b>*Integration of Technology: Pearson Interactive Science Program</b>					
<b>*Equipment needed: see teacher's edition</b>					
<b>*Vocabulary: see unit overview for all vocabulary associated with this unit</b>					

Learning Outcomes	Learning Activities/Instructional Strategies
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<p>Students Will Be Able To:</p> <ul style="list-style-type: none"><li>● explain how erosion and deposition can change Earth's surface</li></ul>	<p><b>Lesson Sequence</b></p> <ol style="list-style-type: none"><li>1. <b>Engage:</b><ol style="list-style-type: none"><li>a. Students tell what they think might cause natural rock formations.</li><li>b. Introduce lesson vocabulary.</li></ol></li><li>2. <b>Explore It! <i>How does melting ice cause erosion?</i></b></li><li>3. <b>Explain:</b><ol style="list-style-type: none"><li>a. Review lesson question.</li><li>b. Students read <i>Erosion and Deposition, Water Erosion and Deposition</i>, and <i>Wind Erosion and Deposition</i> then answer questions using reading strategies.</li></ol></li><li>4. <b>Math Connection</b><ol style="list-style-type: none"><li>a. Students answer questions about the rate of water erosion.</li></ol></li><li>5. <b>Go Green: <i>Blown Over</i></b><ol style="list-style-type: none"><li>a. Students use sand and a straw to test different ways to prevent wind erosion.</li></ol></li><li>6. <b>Elaborate:</b><ol style="list-style-type: none"><li>a. <b>Science Notebook:</b> Students use the word <i>erosion</i> to write a sentence that demonstrates its meaning.</li></ol></li><li>7. <b>Evaluate:</b><ol style="list-style-type: none"><li>a. Review lesson vocabulary</li><li>b. Students complete the Lesson Check blackline master to determine whether they need additional help with lesson content.</li></ol></li></ol>
<p><b>Differentiation:</b></p> <p>Embedded in the program are</p> <ul style="list-style-type: none"><li>● strategies for English Language Learners</li><li>● leveled readers</li><li>● resources to address multiple intelligences</li></ul>	
<p><b>Resources Provided:</b> <i>Pearson Interactive Science</i></p>	

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Earth's Surface: Lesson 5			
<b>Content Area: Science</b>			
<b>Lesson Title:</b> <i>How Does Earth's Surface Change?</i>			<b>Timeframe:</b> 3-4 class periods
Lesson Components			
<b><u>*21<sup>st</sup> Century Themes</u></b>			
Global Awareness	Financial, Economic, Business, and Entrepreneurial Literacy	Civic Literacy	Health Literacy
<b><u>*21<sup>st</sup> Century Skills</u></b>			
x Creativity and Innovation	x Critical Thinking and Problem Solving	x Communication and Collaboration	Information Literacy
Media Literacy	ICT Literacy	x Life and Career Skills	
<b>*Interdisciplinary Connections: see unit overview</b>			
<b>*Integration of Technology: Pearson Interactive Science Program</b>			
<b>*Equipment needed: see teacher's edition</b>			
<b>*Vocabulary: see unit overview for all vocabulary associated with this unit</b>			

Learning Outcomes	Learning Activities/Instructional Strategies
Students Will Be Able To: <ul style="list-style-type: none"> <li>● describe how forces change Earth's surface</li> </ul>	<b>Lesson Sequence</b> <ol style="list-style-type: none"> <li>1. <b>Engage:</b> <ol style="list-style-type: none"> <li>a. Students tell what might cause changes in Earth's surface.</li> <li>b. Introduce lesson vocabulary.</li> </ol> </li> <li>2. <b>Explore It! <i>How do forces affect Earth's surface?</i></b></li> <li>3. <b>Explain:</b> <ol style="list-style-type: none"> <li>a. Review lesson question.</li> <li>b. Students read <i>Earth's Plates, Changes Over Time</i>, and <i>Constructive and Destructive Forces</i> then answer questions using reading strategies.</li> </ol> </li> <li>4. <b>Lightning Lab: <i>Model Forces</i></b> <ol style="list-style-type: none"> <li>a. Students flatten a ball of clay and manipulate it with their hands and tell how Earth's surface would change if the clay were Earth's plates.</li> </ol> </li> <li>5. <b>Elaborate:</b> <ol style="list-style-type: none"> <li>a. <b>Science Notebook:</b> Students write about a tool that scientists might use to detect and measure</li> </ol> </li> </ol>

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	<p>plate movements.</p> <p>6. <b>Evaluate:</b></p> <ol style="list-style-type: none"><li>a. Review lesson vocabulary</li><li>b. Students complete the Lesson Check blackline master to determine whether they need additional help with lesson content.</li></ol>
<p><b>Differentiation:</b></p> <p>Embedded in the program are</p> <ul style="list-style-type: none"><li>● strategies for English Language Learners</li><li>● leveled readers</li><li>● resources to address multiple intelligences</li></ul>	
<p><b>Resources Provided:</b> <i>Pearson Interactive Science</i></p>	

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Earth's Surface: Lesson 6			
<b>Content Area: Science</b>			
<b>Lesson Title:</b> <i>What Are Some Energy Sources?</i>			<b>Timeframe:</b> 3-4 class periods
Lesson Components			
<b><u>*21<sup>st</sup> Century Themes</u></b>			
Global Awareness	Financial, Economic, Business, and Entrepreneurial Literacy	Civic Literacy	Health Literacy
<b><u>*21<sup>st</sup> Century Skills</u></b>			
x Creativity and Innovation	x Critical Thinking and Problem Solving	x Communication and Collaboration	Information Literacy
Media Literacy	ICT Literacy	x Life and Career Skills	
<b>*Interdisciplinary Connections: see unit overview</b>			
<b>*Integration of Technology: Pearson Interactive Science Program</b>			
<b>*Equipment needed: see teacher's edition</b>			
<b>*Vocabulary: see unit overview for all vocabulary associated with this unit</b>			

Learning Outcomes	Learning Activities/Instructional Strategies
Students Will Be Able To: <ul style="list-style-type: none"> <li>● describe renewable, nonrenewable, and inexhaustible energy resources</li> </ul>	<b>Lesson Sequence</b> <ol style="list-style-type: none"> <li>1. <b>Engage:</b> <ol style="list-style-type: none"> <li>a. Students tell how they think wind turbines use the energy in the wind.</li> <li>b. Introduce lesson vocabulary.</li> </ol> </li> <li>2. <b>Explore: My Planet Diary <i>Science Stats</i></b></li> <li>3. <b>Explain:</b> <ol style="list-style-type: none"> <li>a. Review lesson question.</li> <li>b. Students read <i>Energy Resources, Renewable and Inexhaustible Resources</i>, and <i>Nonrenewable Resources</i> then answer questions using reading strategies.</li> </ol> </li> <li>4. <b>Go Green: <i>Compost It!</i></b> <ol style="list-style-type: none"> <li>a. Students make a compost pile using a plastic container and household waste.</li> </ol> </li> <li>5. <b>Math Connection</b> <ol style="list-style-type: none"> <li>a. Students analyze a circle graph about the amount of inexhaustible and renewable resources that the United States used in 2007.</li> </ol> </li> <li>6. <b>Elaborate:</b></li> </ol>

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	<ol style="list-style-type: none"> <li>a. Students learn the benefits of using energy from biomass and describe one advantage of using fuels from biomass.</li> </ol> <p>7. <b>Evaluate:</b></p> <ol style="list-style-type: none"> <li>a. Review lesson vocabulary</li> <li>b. Students complete the Lesson Check blackline master to determine whether they need additional help with lesson content.</li> </ol>
<p><b>Differentiation:</b> Embedded in the program are</p> <ul style="list-style-type: none"> <li>• strategies for English Language Learners</li> <li>• leveled readers</li> <li>• resources to address multiple intelligences</li> </ul>	
<p><b>Resources Provided:</b> <i>Pearson Interactive Science</i></p>	

<b>Earth's Surface: Lesson 7</b>					
<b>Content Area: Science</b>					
<b>Lesson Title:</b> <i>What is Pollution?</i>				<b>Timeframe:</b> 3-4 class periods	
<b>Lesson Components</b>					
<b>*<u>21<sup>st</sup> Century Themes</u></b>					
	Global Awareness		Financial, Economic, Business, and Entrepreneurial Literacy	Civic Literacy	Health Literacy
<b>*<u>21<sup>st</sup> Century Skills</u></b>					
x	Creativity and Innovation	x	Critical Thinking and Problem Solving	x	Communication and Collaboration
	Media Literacy		ICT Literacy	x	Life and Career Skills
<b>*Interdisciplinary Connections: see unit overview</b>					
<b>*Integration of Technology: Pearson Interactive Science Program</b>					
<b>*Equipment needed: see teacher's edition</b>					
<b>*Vocabulary: see unit overview for all vocabulary associated with this unit</b>					

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Learning Outcomes	Learning Activities/Instructional Strategies
<p>Students Will Be Able To:</p> <ul style="list-style-type: none"><li>● demonstrate an understanding of some pollutants in water, air, and soil</li></ul>	<p><b>Lesson Sequence</b></p> <ol style="list-style-type: none"><li>1. <b>Engage:</b><ol style="list-style-type: none"><li>a. Students identify items that may harm the environment.</li><li>b. Introduce lesson vocabulary.</li></ol></li><li>2. <b>Explore It! <i>How can pollution affect water?</i></b></li><li>3. <b>Explain:</b><ol style="list-style-type: none"><li>a. Review lesson question.</li><li>b. Students read <i>Pollutants</i> then answer questions using reading strategies.</li></ol></li><li>4. <b>Go Green: <i>Reducing Pollution</i></b><ol style="list-style-type: none"><li>a. Students make a list of ways that they might be putting pollutants into water, soil, and air and then list ways they could produce fewer pollutants.</li></ol></li><li>5. <b>Elaborate:</b><ol style="list-style-type: none"><li>a. <b>Science Notebook:</b> Students write about how they can reduce pollution in their community.</li></ol></li><li>6. <b>Evaluate:</b><ol style="list-style-type: none"><li>a. Review lesson vocabulary</li><li>b. Students complete the Lesson Check blackline master to determine whether they need additional help with lesson content.</li></ol></li></ol>
<p><b>Differentiation:</b></p> <p>Embedded in the program are</p> <ul style="list-style-type: none"><li>● strategies for English Language Learners</li><li>● leveled readers</li><li>● resources to address multiple intelligences</li></ul>	
<p><b>Resources Provided:</b> <i>Pearson Interactive Science</i></p>	

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Earth and Space: Lesson 1				
<b>Content Area: Science</b>				
<b>Lesson Title:</b> <i>How Does Earth Move?</i>			<b>Timeframe:</b> 3-4 class periods	
Lesson Components				
<b><u>*21<sup>st</sup> Century Themes</u></b>				
Global Awareness		Financial, Economic, Business, and Entrepreneurial Literacy	Civic Literacy	Health Literacy
<b><u>*21<sup>st</sup> Century Skills</u></b>				
x Creativity and Innovation	x Critical Thinking and Problem Solving	x Communication and Collaboration	Information Literacy	
Media Literacy	ICT Literacy	x Life and Career Skills		
<b>*Interdisciplinary Connections: see unit overview</b>				
<b>*Integration of Technology: Pearson Interactive Science Program</b>				
<b>*Equipment needed: see teacher's edition</b>				
<b>*Vocabulary: see unit overview for all vocabulary associated with this unit</b>				

Learning Outcomes	Learning Activities/Instructional Strategies
<p>Students Will Be Able To:</p> <ul style="list-style-type: none"> <li>● describe how Earth rotates and revolves</li> <li>● understand why the sun, moon, and stars appear to move across the sky</li> </ul>	<p><b>Lesson Sequence</b></p> <ol style="list-style-type: none"> <li>1. <b>Engage:</b> <ol style="list-style-type: none"> <li>a. Students describe the path they think the sun will take across the sky during the course of a day.</li> <li>b. Introduce lesson vocabulary.</li> </ol> </li> <li>2. <b>Explore It! <i>How does sunlight strike Earth's surface?</i></b></li> <li>3. <b>Explain:</b> <ol style="list-style-type: none"> <li>a. Review lesson question.</li> <li>b. Students read <i>Earth and the Sun</i>, <i>Earth's Rotation</i>, <i>Earth's Revolution</i>, and <i>Seasons</i> then answer questions using reading strategies.</li> </ol> </li> <li>4. <b>Lightning Lab: <i>Day and Night</i></b> <ol style="list-style-type: none"> <li>a. Students shine a flashlight on a globe and notice which parts of the globe have light shining on them and then turn the globe slowly and explain what they see.</li> </ol> </li> </ol>

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	<p>5. <b>Elaborate:</b></p> <p style="padding-left: 20px;">a. <b>Science Notebook:</b> Students write a paragraph that explains why every four years we have a leap year and add an extra day to the calendar.</p> <p>6. <b>Evaluate:</b></p> <p style="padding-left: 20px;">a. Review lesson vocabulary</p> <p style="padding-left: 20px;">b. Students complete the Lesson Check blackline master to determine whether they need additional help with lesson content.</p>
<p><b>Differentiation:</b></p> <p>Embedded in the program are</p> <ul style="list-style-type: none"> <li>• strategies for English Language Learners</li> <li>• leveled readers</li> <li>• resources to address multiple intelligences</li> </ul>	
<p><b>Resources Provided:</b> <i>Pearson Interactive Science</i></p>	

<b>Earth and Space: Lesson 2</b>							
<b>Content Area: Science</b>							
<b>Lesson Title:</b> <i>What is a Star?</i>				<b>Timeframe:</b> 3-4 class periods			
<b>Lesson Components</b>							
<b><u>*21<sup>st</sup> Century Themes</u></b>							
	Global Awareness		Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy		Health Literacy
<b><u>*21<sup>st</sup> Century Skills</u></b>							
x	Creativity and Innovation	x	Critical Thinking and Problem Solving	x	Communication and Collaboration		Information Literacy
	Media Literacy		ICT Literacy	x	Life and Career Skills		
<b>*Interdisciplinary Connections: see unit overview</b>							
<b>*Integration of Technology: Pearson Interactive Science Program</b>							
<b>*Equipment needed: see teacher's edition</b>							
<b>*Vocabulary: see unit overview for all vocabulary associated with this unit</b>							

<b>Learning Outcomes</b>	<b>Learning Activities/Instructional Strategies</b>
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Created for New Jersey school districts through a project of the New Jersey Department of Education, Office of Academic Standards, in partnership with the N.J. Association for Supervision and Curriculum Development and the N.J. Principals and Supervisors Association.



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<p>Students Will Be Able To:</p> <ul style="list-style-type: none"><li>● describe the physical characteristics of the sun and understand why the star Polaris is important</li></ul>	<p><b>Lesson Sequence</b></p> <ol style="list-style-type: none"><li>1. <b>Engage:</b><ol style="list-style-type: none"><li>a. Students discuss whether or not they think the sun has a hard surface like Earth.</li><li>b. Introduce lesson vocabulary.</li></ol></li><li>2. <b>Explore: My Planet Diary Misconception</b></li><li>3. <b>Explain:</b><ol style="list-style-type: none"><li>a. Review lesson question.</li><li>b. Students read <i>Stars, Characteristics of the Sun, Constellations</i>, and <i>Stars on the Move</i> then answer questions using reading strategies.</li></ol></li><li>4. <b>Lightning Lab: Measuring Shadows</b><ol style="list-style-type: none"><li>a. Students measure a partner's shadow at different time during the day and describe how their shadow changes as the sun moves.</li></ol></li><li>5. <b>Elaborate:</b><ol style="list-style-type: none"><li>a. <b>Science Notebook:</b> Students write how the radio waves from a solar wind might affect radio communications on Earth.</li></ol></li><li>6. <b>Evaluate:</b><ol style="list-style-type: none"><li>a. Review lesson vocabulary</li><li>b. Students complete the Lesson Check blackline master to determine whether they need additional help with lesson content.</li></ol></li></ol>
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<p><b>Resources Provided:</b> <i>Pearson Interactive Science</i></p>	

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Earth and Space: Lesson 3					
<b>Content Area: Science</b>					
<b>Lesson Title:</b> <i>What Are the Inner Planets?</i>				<b>Timeframe:</b> 3-4 class periods	
Lesson Components					
<b>*<u>21<sup>st</sup> Century Themes</u></b>					
Global Awareness		Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy	Health Literacy
<b>*<u>21<sup>st</sup> Century Skills</u></b>					
x Creativity and Innovation	x	Critical Thinking and Problem Solving	x	Communication and Collaboration	Information Literacy
Media Literacy		ICT Literacy	x	Life and Career Skills	
<b>*Interdisciplinary Connections: see unit overview</b>					
<b>*Integration of Technology: Pearson Interactive Science Program</b>					
<b>*Equipment needed: see teacher's edition</b>					
<b>*Vocabulary: see unit overview for all vocabulary associated with this unit</b>					

Learning Outcomes	Learning Activities/Instructional Strategies
<p>Students Will Be Able To:</p> <ul style="list-style-type: none"> <li>● identify the outer planets, inner planets, and Earth's position in the solar system</li> <li>● describe how technology has helped people explore space</li> </ul>	<p><b>Lesson Sequence</b></p> <ol style="list-style-type: none"> <li>1. <b>Engage:</b> <ol style="list-style-type: none"> <li>a. Students name the planet shown.</li> <li>b. Introduce lesson vocabulary.</li> </ol> </li> <li>2. <b>Explore It! <i>How does distance affect orbiting time?</i></b></li> <li>3. <b>Explain:</b> <ol style="list-style-type: none"> <li>a. Review lesson question.</li> <li>b. Students read <i>Planets, Orbiting Objects, Mercury, Venus, Earth and the Moon</i>, and <i>Mars</i> then answer questions using reading strategies.</li> </ol> </li> <li>4. <b>Math Connection</b> <ol style="list-style-type: none"> <li>a. Students find out how much an astronaut weighs on different planets.</li> </ol> </li> <li>5. <b>Lightning Lab: <i>Model Planets</i></b> <ol style="list-style-type: none"> <li>a. Students make scale models of the inner</li> </ol> </li> </ol>

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	<p style="text-align: right;">planets.</p> <p><b>6. Elaborate:</b></p> <p style="padding-left: 20px;">a. Students learn the amount of time it takes radio waves to travel from Earth to the moon and from Earth to Saturn.</p> <p><b>7. Evaluate:</b></p> <p style="padding-left: 20px;">a. Review lesson vocabulary</p> <p style="padding-left: 20px;">b. Students complete the Lesson Check blackline master to determine whether they need additional help with lesson content.</p>
<p><b>Differentiation:</b></p> <p>Embedded in the program are</p> <ul style="list-style-type: none"> <li>● strategies for English Language Learners</li> <li>● leveled readers</li> <li>● resources to address multiple intelligences</li> </ul>	
<p><b>Resources Provided:</b> <i>Pearson Interactive Science</i></p>	

<b>Earth and Space: Lesson 4</b>						
<b>Content Area: Science</b>						
<b>Lesson Title:</b> <i>What Are the Outer Planets?</i>				<b>Timeframe:</b> 3-4 class periods		
<b>Lesson Components</b>						
<b><u>*21<sup>st</sup> Century Themes</u></b>						
	Global Awareness		Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy	Health Literacy
<b><u>*21<sup>st</sup> Century Skills</u></b>						
x	Creativity and Innovation	x	Critical Thinking and Problem Solving	x	Communication and Collaboration	Information Literacy
	Media Literacy		ICT Literacy	x	Life and Career Skills	
<b>*Interdisciplinary Connections: see unit overview</b>						
<b>*Integration of Technology: Pearson Interactive Science Program</b>						
<b>*Equipment needed: see teacher's edition</b>						
<b>*Vocabulary: see unit overview for all vocabulary associated with this unit</b>						

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Learning Outcomes	Learning Activities/Instructional Strategies
<p>Students Will Be Able To:</p> <ul style="list-style-type: none"><li>● identify Jupiter, Saturn, Uranus, and Neptune and describe their common characteristics</li></ul>	<p><b>Lesson Sequence</b></p> <ol style="list-style-type: none"><li>1. <b>Engage:</b><ol style="list-style-type: none"><li>a. Students describe what caused the everyday changes in Jupiter’s surface.</li><li>b. Introduce lesson vocabulary.</li></ol></li><li>2. <b>Explore It! <i>How are the sizes of the inner and outer planets different?</i></b></li><li>3. <b>Explain:</b><ol style="list-style-type: none"><li>a. Review lesson question.</li><li>b. Students read <i>Gas Giants, Jupiter, Saturn, Uranus, Neptune</i>, and <i>Exploring the Giants</i> then answer questions using reading strategies.</li></ol></li><li>4. <b>Lightning Lab: <i>Reading in the Dark</i></b><ol style="list-style-type: none"><li>a. Students make a night vision flashlight for reading star charts in the dark.</li></ol></li><li>5. <b>Elaborate:</b><ol style="list-style-type: none"><li>a. Students compare Jupiter’s Great Red Spot to a type of storm on Earth.</li></ol></li><li>6. <b>Evaluate:</b><ol style="list-style-type: none"><li>a. Review lesson vocabulary</li><li>b. Students complete the Lesson Check blackline master to determine whether they need additional help with lesson content.</li></ol></li></ol>
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Earth and Space: Lesson 5							
<b>Content Area: Science</b>							
<b>Lesson Title:</b> <i>What Are Asteroids, Meteors, Comets, and Moons?</i>				<b>Timeframe:</b> 3-4 class periods			
Lesson Components							
<b><u>*21<sup>st</sup> Century Themes</u></b>							
	Global Awareness		Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy		Health Literacy
<b><u>*21<sup>st</sup> Century Skills</u></b>							
x	Creativity and Innovation	x	Critical Thinking and Problem Solving	x	Communication and Collaboration		Information Literacy
	Media Literacy		ICT Literacy	x	Life and Career Skills		
<b>*Interdisciplinary Connections: see unit overview</b>							
<b>*Integration of Technology: Pearson Interactive Science Program</b>							
<b>*Equipment needed: see teacher's edition</b>							
<b>*Vocabulary: see unit overview for all vocabulary associated with this unit</b>							

Learning Outcomes	Learning Activities/Instructional Strategies
<p>Students Will Be Able To:</p> <ul style="list-style-type: none"> <li>● understand the difference between moons, asteroids, comets, meteoroids, meteors, and meteorites</li> </ul>	<p><b>Lesson Sequence</b></p> <ol style="list-style-type: none"> <li>1. <b>Engage:</b> <ol style="list-style-type: none"> <li>a. Students identify rocks that were asteroids.</li> <li>b. Introduce lesson vocabulary.</li> </ol> </li> <li>2. <b>Explore It! <i>How does a meteoroid fall through Earth's atmosphere?</i></b></li> <li>3. <b>Explain:</b> <ol style="list-style-type: none"> <li>a. Review lesson question.</li> <li>b. Students read <i>Asteroids, Meteors, Comets, Dwarf Planets</i>, and <i>Moons</i> then answer questions using reading strategies.</li> </ol> </li> <li>4. <b>At-Home Lab: <i>Meteor Shower</i></b> <ol style="list-style-type: none"> <li>a. Students find information about meteor</li> </ol> </li> </ol>

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	<p>showers that are visible from where they live.</p> <p>5. <b>Elaborate:</b></p> <ol style="list-style-type: none"><li>a. Students learn the history of Halley’s Comet and tell why it takes so long for Halley’s Comet to be seen from Earth.</li></ol> <p>6. <b>Evaluate:</b></p> <ol style="list-style-type: none"><li>a. Review lesson vocabulary</li><li>b. Students complete the Lesson Check blackline master to determine whether they need additional help with lesson content.</li></ol>
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### Unit D Overview

**Content Area: Science**

**Unit Title:** Unit D Physical Science: *Properties of Matter, Forces and Motion, and Changing Forms of Energy*

**Target Course/Grade Level: 5**

#### Unit Background

Regardless of the movement observed in matter, the particles that make up each substance are constantly moving because they have kinetic energy – the energy of movement. The faster a substance’s atoms and molecules move, the more kinetic energy the substance has. The particles also have potential energy – the energy that comes from the position or shape of an object. The total potential and kinetic energy in a substance is its thermal energy. The more kinetic energy, the more thermal energy a substance has. Thermal energy always flows from warmer matter to cooler matter.

A chemical change occurs when matter is changed to produce one or more new substances with properties that are different from the original substance. When substances undergo a chemical change, they may seem to disappear, but matter is never destroyed or created during a chemical change. The amount of matter in the new substance is always the same as the amount of matter in the original substance. This law is the law of conservation of matter (mass).

Atoms contain protons and neutrons that make up most of the mass of the atom and are located in its nucleus. Electrons exist in areas outside the nucleus and have negative charges and very little mass. Protons have positive charges and neutrons are neutral. Atoms are neutral because they have an equal number of protons and electrons. However, most atoms have a tendency to gain or lose electrons giving them an electrical charge. These charged atoms are called ions.

Most of the time more than one force acts on an object. The combination of all forces is called net force. When net force is zero, the object is in equilibrium. One kind of force is friction. There are four types of friction – static, rolling, sliding, and fluid friction. Inertia is the tendency of an object to continue its motion (or lack of) unless acted on by unbalanced forces. Objects with greater mass have greater inertia so will need a greater force to get the object moving, to stop its movement, or change its direction.

Charged particles produce visible light and all other types of electromagnetic waves. An electric field surrounds each charged particle and when a charged particle moves, it produces a magnetic field. Changes in the magnetic field caused by continued motion of the charged particle causes changes in the electric field. As this process continues, the two fields regenerate each other and their energy travels in the form of transverse waves called electromagnetic waves. All electromagnetic waves travel at the same speed in a vacuum: about 300,000 km/sec (the speed of light), however, the waves differ in frequency (the number of waves that pass a given point in a certain amount of time) and wavelength (the distance between two corresponding parts of a wave). The electromagnetic spectrum, in order from least to greatest frequency is: radio waves, microwaves, infrared rays, visible light, ultraviolet waves, X-rays, and gamma rays.

Like light, sound travels as a wave (longitudinal wave) and interacts with surfaces and with each other in three ways: reflection, diffraction, and interference. Sound waves may reflect, or bounce back, when they hit a surface. A reflected sound is known as an echo. Sound waves also bend around objects. This bending is known as diffraction; hearing people talk around the corner in a hallway is the result of diffraction. Sound waves that interact with each other cause interference and may distort sound.

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When electric charges flow through a material, they produce an electric current. The amount of charge that flows through the material in a given amount of time is the rate of the electric current or amp. There are two types of currents: direct current (DC) in which the electric charges flow in only one direction, and alternating current (AC) in which the flow of current continually reverses direction. Battery-operated devices use direct current, and most electric appliances use an alternating current.

**Primary interdisciplinary connections: Reading, Math, Social Studies, Language Arts, Writing, 21<sup>st</sup> century themes:**

- **Creativity and Innovation**
  - Think Creatively
  - Work Creatively with Others
  - Implement Innovations
- **Critical Thinking and Problem Solving**
  - Reason Effectively
  - Use Systems Thinking
  - Make Judgments and Decisions
  - Solve Problems
- **Communication and Collaboration**
  - Communicate Clearly
  - Collaborate with Others

**Standard(s)**

- **5-PS1 Matter and Its Interactions**
- **5-PS2 Motion and Stability: Forces and Interactions**
- **4-PS3 Energy**
- **4-PS4 Waves and Their Applications in Technologies for Information Transfer**

**Performance Expectations**

- **5-PS1-1 Develop a model to describe that matter is made of particles too small to be seen.**
- **5-PS1-2 Measure and graph quantities to provide evidence that regardless of the type of change that occurs when heating, cooling, or mixing substances, the total weight of matter is conserved.**
- **5-PS1-3 Make observations and measurement to identify materials based on their properties.**
- **5-PS1-4 Conduct an investigation to determine whether the mixing of two or more substances results in new substances.**
- **5-PS2-1 Support an argument that the gravitational force exerted by Earth on objects is directed down.**
- **4-PS3-1 Use evidence to construct an explanation relating the speed of an object to the energy of that object.**
- **4-PS3-2 Make observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents.**
- **4-PS3-3 Ask questions and predict outcomes about the changes in energy that occur when objects collide.**
- **4-PS4-1 Develop a model of waves to describe patterns in terms of amplitude and wavelength and that waves can cause objects to move.**



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- **4-PS4-2 Develop a model to describe that light reflecting from objects and entering the eye allows objects to be seen.**

### Science and Engineering Practices

#### **Asking Questions and Defining Problems**

- Asking questions and defining problems in 3-5 builds on grades K-2 experiences and progresses to specifying qualitative relationships.

#### **Planning and Carrying Out Investigations**

- Planning and carrying out investigations to answer questions or test solutions to problems in 3-5 builds on K-2 experiences and progresses to include investigations that control variables and provide evidence to support explanations or design solutions.

#### **Constructing Explanations and Designing Solutions**

- Constructing explanations and designing solutions in 3-5 builds on K-2 experiences and progresses to the use of evidence in constructing explanation that specify variables that describe and predict phenomena and in designing multiple solutions to design problems.

#### **Developing and Using Models**

- Modeling in 3-5 builds on K-2 experiences and progresses to building and revising simple models and using models to represent events and design solutions.

#### **Using Mathematics and Computational Thinking**

- Mathematical and computational thinking in 3-5 builds on K-2 experiences and progresses to extending quantitative measurements to a variety of physical properties and using computation and mathematics to analyze data and compare alternative design solutions.

#### **Engaging in Argument from Evidence**

- Engaging in argument from evidence in 3-5 build on K-2 experiences and progresses to critiquing the scientific explanations or solutions proposed by peers by citing relevant evidence about the natural and designed world(s).

#### **Scientific Knowledge is Based on Empirical Evidence**

#### **Disciplinary Core Ideas**

- **PS1.A: Structure and Properties of Matter**
- **PS1.B: Chemical Reactions**
- **PS2.B: Types of Interactions**
- **PS3.A: Definitions of Energy**
- **PS3.B: Conservation of Energy and Energy Transfer**
- **PS3.C: Relationship Between Energy and Forces**
- **PS4.A: Wave Properties**
- **PS4.B: Electromagnetic Radiation**

#### **Crosscutting Concepts**

- **Cause and Effect**
- **Scale, Proportion, and Quantity**
- **Energy and Matter**
- **Patterns**

#### **Performance Expectations (PE)**

#### **Supporting Concepts, Practices, and Ideas**

5-PS1-1

Use models to describe phenomena.

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	Matter of any type can be subdivided into particles that are too small to see, but even then the matter still exists and can be detected by other means. A model showing that gases are made from matter particles that are too small to see and are moving freely around in space can explain many observations, including the inflation and shape of a balloon and the effects of air on larger particles or objects.
	Natural objects exist from the very small to the immensely large.
5-PS1-2	Measure and graph quantities such as weight to address scientific and engineering questions and problems.
	The amount (weight) of matter is conserved when it changes form, even in transitions in which it seems to vanish.
	No matter what reaction or change in properties occurs, the total weight of the substances does not change.
	Standard units are used to measure and describe physical quantities such as weight, time, temperature, and volume.
5-PS1-3	Make observations and measurements to produce data to serve as the basis for evidence for an explanation of a phenomenon.
	Measurements of a variety of properties can be used to identify materials.
	Standard units are used to measure and describe physical quantities such as weight, time, temperature, and volume.
5-PS1-4	Conduct an investigation collaboratively to produce data to serve as the basis for evidence, using fair tests in which variables are controlled and the number of trials considered.
	When two or more different substances are mixed, a new substance with different properties may be formed.
	Cause and effect relationships are routinely identified and used to explain change.
5-PS2-1	Support an argument with evidence, data, or a model.
	The gravitational force of Earth acting on an object near Earth's surface pulls that object toward the planet's center.
	Cause and effect relationships are routinely identified and used to explain change.
4-PS3-1	Use evidence (e.g., measurements, observations, patterns) to construct an explanation.
	The faster a given object is moving, the more energy it possesses.
	Energy can be transferred in various way and between objects.
4-PS3-2	Make observations to produce data to serve as the basis for evidence for an explanation of a phenomenon or test a design solution.
	Energy can be moved from place to place by moving objects or through sound, light, or electric currents.
	Energy is present whenever there are moving objects, sound, light, or heat. When objects collide, energy can be transferred from one object to another, thereby changing their motion. In such collisions, some energy is typically also transferred

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	to the surrounding air; as a result, the air gets heated and sound is produced.
	Light also transfers energy from place to place.
	Energy can also be transferred from place to place by electric currents, which can then be used locally to produce motion, sound, heat, or light. The currents may have been produced originally by transforming the energy of motion into electrical energy.
	Energy can be transferred in various way and between objects.
4-PS3-3	Ask questions that can be investigated and predict reasonable outcomes based on patterns such as cause and effect relationships.
	Energy can be moved from place to place by moving objects or through sound, light, or electric currents.
	Energy is present whenever there are moving objects, sound, light, or heat. When objects collide, energy can be transferred from one object to another, thereby changing their motion. In such collisions, some energy is typically also transferred to the surrounding air; as a result, the air gets heated and sound is produced.
	When objects collide, the contact forces transfer energy so as to change the objects' motions.
	Energy can be transferred in various ways and between objects.
4-PS4-1	Develop a model using an analogy, example, or abstract representation to describe a scientific principle.
	Science findings are based on recognizing patterns.
	Waves of the same type can differ in amplitude (height of the wave) and wavelength (spacing between wave peaks).
	Similarities and differences in patterns can be used to sort, classify, and analyze simple rates of change for natural phenomena.
4-PS4-2	Develop a model to describe phenomena.
	An object can be seen when light reflected from its surface enters the eyes.
	Cause and effect relationships are routinely identified.
<b>Related Common Core ELA Standards</b>	
RI.5.1	Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text. (5-PS2-1) (4-PS3-1)
RI.5.3	Explain the relationships or interactions between two or more individuals, events, ideas, or concepts in a historical, scientific, or technical text based on specific information in the text. (4-PS3-1)
RI.5.7	Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently. (5-PS1-1)
RI.5.9	Integrate information from several texts on the same topic in order to write or speak about the subject knowledgeably. (5-PS2-1) (4-PS3-1)
W.5.1	Write opinion pieces on topics or texts, supporting a point of view with reasons and information. (5-PS2-1)

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W.5.2	Write informative/explanatory texts to examine a topic and convey ideas and information clearly. (4-PS3-1)		
W.5.7	Conduct short research projects that use several sources to build knowledge through investigation of different aspects of a topic. (5-PS1-2) (5-PS1-3) (5-PS1-4) (4-PS3-2) (4-PS3-3)		
W.5.8	Recall relevant information from experiences or gather relevant information from print and digital sources; summarize or paraphrase information in notes and finished work, and provide a list of sources. (5-PS1-2) (5-PS1-3) (5-PS1-4) (4-PS3-1) (4-PS3-2) (4-PS3-3)		
W.5.9	Draw evidence from literary or informational texts to support analysis, reflection, and research. (5-PS1-2) (5-PS1-3) (5-PS1-4) (4-PS3-1)		
SL.5.5	Include multimedia components (e.g., graphics, sound) and visual displays in presentations when appropriate to enhance the development of main ideas or themes. (4-PS4-1) (4-PS4-2)		
<b>Related Common Core Mathematics Standards</b>			
MP.2	Reason abstractly and quantitatively. (5-PS1-1) (5-PS1-2) (5-PS1-3)		
MP.4	Model with mathematics. (5-PS1-1) (5-PS1-2) (5-PS1-3) (4-PS4-1) (4-PS4-2)		
MP.5	Use appropriate tools strategically. (5-PS1-2) (5-PS1-3)		
4.G.A.1	Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures. (4-PS4-1) (4-PS4-2)		
5.NBT.A.1	Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left. (5-PS1-1)		
5.NF.B.7	Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions. (5-PS1-1)		
5.MD.A.1	Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems. (5-PS1-2)		
5.MD.C.3	Recognize volume as an attribute of solid figures and understand concepts of volume measurement. (5-PS1-1)		
5.MD.C.4	Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units. (5-PS1-1)		
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; vertical-align: top;"> <p><b>Unit Essential Questions</b></p> <ul style="list-style-type: none"> <li>● <i>What makes up matter?</i></li> <li>● <i>How can matter be described?</i></li> <li>● <i>What are solids, liquids, and gases?</i></li> <li>● <i>What are mixtures and solutions?</i></li> <li>● <i>How does matter change?</i></li> <li>● <i>What are forces?</i></li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <p><b>Unit Enduring Understandings</b></p> <ul style="list-style-type: none"> <li>● <b>Scientific inquiry involves asking scientifically oriented questions, collecting evidence, forming explanations, connecting explanations to scientific knowledge and theory, and communicating and justifying explanations.</b></li> <li>● <b>Safety first!</b></li> <li>● <b>Mathematics is a tool used to model objects, events,</b></li> </ul> </td> </tr> </table>		<p><b>Unit Essential Questions</b></p> <ul style="list-style-type: none"> <li>● <i>What makes up matter?</i></li> <li>● <i>How can matter be described?</i></li> <li>● <i>What are solids, liquids, and gases?</i></li> <li>● <i>What are mixtures and solutions?</i></li> <li>● <i>How does matter change?</i></li> <li>● <i>What are forces?</i></li> </ul>	<p><b>Unit Enduring Understandings</b></p> <ul style="list-style-type: none"> <li>● <b>Scientific inquiry involves asking scientifically oriented questions, collecting evidence, forming explanations, connecting explanations to scientific knowledge and theory, and communicating and justifying explanations.</b></li> <li>● <b>Safety first!</b></li> <li>● <b>Mathematics is a tool used to model objects, events,</b></li> </ul>
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- *What are Newton's laws?*
- *What are machines?*
- *What is energy?*
- *What is sound energy?*
- *What is light energy?*

and relationships in the natural and designed world.

- The development of technology and advances in science are mutually supportive in driving innovation in both fields.
- Physical constraints and social values play a role in limiting the use of technology to solve problems.
- Thinking systematically means looking for the relationships between parts.
- The atomic structures of materials determine their properties.
- There are several ways in which elements and compounds react to form new substances and each reaction involves the flow of energy.
- The same basic rules govern the motion of all bodies, from planets and stars to birds and billiard balls.
- Energy takes many forms.
- These forms can be grouped into types of energy that are associated with the motion of mass (kinetic energy), and types of energy associated with the position of mass and with energy fields (potential energy).

### Unit Learning Targets

*Students will be Able To:*

- recognize that all things are made of particles called atoms and molecules, which cannot be seen without using magnifying instruments
- recognize basic properties of matter
- describe properties of states of matter
- identify phase changes of matter
- describe properties of solutions
- explain that mixtures can be separated based on properties of their parts
- recognize that many physical and chemical changes are affected by temperature
- describe some forces that cause objects to move
- understand that a given object will have more change of motion with a large force than with a small force and that a given force will cause more change of motion on small masses than large masses
- describe different kinds of machines and understand how they work
- describe potential and kinetic energy and explain the different forms of energy into which energy can change
- describe sound energy
- describe light energy

### Unit Vocabulary:

- **Chapter 10:** *atom, atomic theory, chemical change, compound, gas, liquid, mass, mixture, molecule, physical change, solid, solution, temperature, volume*
- **Chapter 11:** *acceleration, contact force, force, friction, gravity, inclined plane, inertia, lever, non-contact force, pulley, screw, simple machines, wedge, wheel and axle*
- **Chapter 12:** *energy, kinetic energy, opaque, potential energy, reflection, refraction, translucent,*

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*transparent, vibration*

### Evidence of Learning

**Summative Assessments at the end of each chapter.**

**Equipment needed:** See teacher's edition

**Teacher Resources:** Pearson Interactive Science

<https://www.pearsonsuccessnet.com/snpapp/login/PsnLandingPage.jsp?showLandingPage=true&ticket=ST-1368125-E9Ki92wc0g5CVII9xxk5-b3-rumba-prod-01-01>

### Formative Assessments

- teacher observation
- student responses to questions
- student participation in inquiry activities
- student interactive science journal
- 
- 

### Lesson Plans

Chapter 10: <i>Properties of Matter</i>	Timeframe
Lesson 1 <i>What Makes Up Matter?</i>	3-4 class periods
Lesson 2 <i>How Can Matter Be Described?</i>	3-4 class periods
Lesson 3 <i>What Are Solids, Liquids, and Gases?</i>	3-4 class periods
Lesson 4 <i>What Are Mixtures and Solutions?</i>	3-4 class periods
Lesson 5 <i>How Does Matter Change?</i>	3-4 class periods

### Inquiry Questions and Labs:

- *How are weight and volume affected when objects are combined?*
- *What are some ways to separate mixtures?*
- *How could a mixture of iron filings, sand, and water be separated?*
- **Lightning Lab: Letters and Atoms**
- *What are some properties of solids?*
- **Lightning Lab: Do I Need a Thermometer?**
- *How can water change state?*
- **Lightning Lab: Wandering Ice**
- *How can a mixture be separated?*
- **At-Home Lab: Mixed-Up Foods**
- *What happens when air heats up?*
- **At-Home Lab: Twin Balloons**
- **Lightning Lab: Comparing Apples and Lemons?**

Chapter 11: <i>Forces and Motion</i>	Timeframe
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Lesson 1 <i>What Are Forces?</i>	3-4 class periods
Lesson 2 <i>What Are Newton's Laws?</i>	3-4 class periods
Lesson 3 <i>What Are Machines?</i>	3-4 class periods
<b>Inquiry Questions and Labs:</b> <ul style="list-style-type: none"> <li>● <i>How can you make a paper helicopter drop slowly?</i></li> <li>● <i>What forces affect the motion of a rocket?</i></li> <li>● <i>How did the bag affect the motion of the rocket?</i></li> <li>● <b>At-Home Lab: Does Gravity Affect You?</b></li> <li>● <i>How can forces affect motion?</i></li> <li>● <b>Go Green: Carry Less, Save Gas</b></li> <li>● <i>What can a wheel and axle do?</i></li> <li>● <b>Lightning Lab: Simple Machines</b></li> </ul>	
<b>Chapter 12: Changing Forms of Energy</b>	<b>Timeframe</b>
Lesson 1 <i>What is Energy?</i>	3-4 class periods
Lesson 2 <i>What is Sound Energy?</i>	3-4 class periods
Lesson 3 <i>What is Light Energy?</i>	3-4 class periods
<b>Inquiry Questions and Labs:</b> <ul style="list-style-type: none"> <li>● <i>How can the amount of stored energy affect motion?</i></li> <li>● <i>How can electrical energy change forms?</i></li> <li>● <i>How can electricity produce sound and motion?</i></li> <li>● <b>Lightning Lab: Rubber-Band Release</b></li> <li>● <i>What can affect the sound made by a rubber band?</i></li> <li>● <b>Lightning Lab: The String Phone</b></li> <li>● <i>What are some colors in white light?</i></li> <li>● <b>At-Home Lab: Shining Through</b></li> </ul>	
<b>Teacher Notes:</b>	
<b>Curriculum Development Resources</b> Click the links below to access additional resources used to design this unit: <ul style="list-style-type: none"> <li>● <b>Next Generation Science Standards (NGSS)</b> <a href="http://www.nextgenscience.org/">http://www.nextgenscience.org/</a></li> <li>● <b>21<sup>st</sup> Century Skills</b> <a href="http://www.p21.org/our-work/p21-framework">http://www.p21.org/our-work/p21-framework</a></li> <li>● <b>New Jersey Standards Clarification Project</b>  <a href="http://www.nj.gov/education/aps/njscp/Phase1allAreas.pdf">http://www.nj.gov/education/aps/njscp/Phase1allAreas.pdf</a></li> </ul>	

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Properties of Matter: Lesson 1					
<b>Content Area: Science</b>					
<b>Lesson Title:</b> <i>What Makes Up Matter?</i>				<b>Timeframe:</b> 3-4 class periods	
Lesson Components					
<b><u>*21<sup>st</sup> Century Themes</u></b>					
Global Awareness		Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy	Health Literacy
<b><u>*21<sup>st</sup> Century Skills</u></b>					
x Creativity and Innovation	x	Critical Thinking and Problem Solving	x	Communication and Collaboration	Information Literacy
Media Literacy		ICT Literacy	x	Life and Career Skills	
<b>*Interdisciplinary Connections: see unit overview</b>					
<b>*Integration of Technology: Pearson Interactive Science Program</b>					
<b>*Equipment needed: see teacher's edition</b>					
<b>*Vocabulary: see unit overview for all vocabulary associated with this unit</b>					

Learning Outcomes	Learning Activities/Instructional Strategies
<p>Students Will Be Able To:</p> <ul style="list-style-type: none"> <li>● recognize that all things are made of particles called atoms and molecules, which cannot be seen without using magnifying instruments</li> </ul>	<p><b>Lesson Sequence</b></p> <ol style="list-style-type: none"> <li>1. <b>Engage:</b> <ol style="list-style-type: none"> <li>a. Students describe colors in an image.</li> <li>b. Introduce lesson vocabulary.</li> </ol> </li> <li>2. <b>Explore: My Planet Diary Fun Fact</b></li> <li>3. <b>Explain:</b> <ol style="list-style-type: none"> <li>a. Review lesson question.</li> </ol> </li> </ol>



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	<p>b. Students read <i>Matter, Elements, Atoms, Atomic Arrangement, and Compounds</i> then answer questions using reading strategies.</p> <p>4. <b>Lightning Lab: Letters and Atoms</b></p> <p>a. Students determine different ways that the letters A, B, C, and D can be ordered.</p> <p>5. <b>Elaborate:</b></p> <p>a. <b>Science Notebook:</b> Students explain if they should be careful chewing cereal if the cereal box label says it contains iron.</p> <p>6. <b>Evaluate:</b></p> <p>a. Review lesson vocabulary</p> <p>b. Students complete the Lesson Check blackline master to determine whether they need additional help with lesson content.</p>
<p><b>Differentiation:</b> Embedded in the program are</p> <ul style="list-style-type: none"> <li>● strategies for English Language Learners</li> <li>● leveled readers</li> <li>● resources to address multiple intelligences</li> </ul>	
<p><b>Resources Provided:</b> <i>Pearson Interactive Science</i></p>	

<b>Properties of Matter: Lesson 2</b>							
<b>Content Area: Science</b>							
<b>Lesson Title:</b> <i>How Can Matter Be Described?</i>				<b>Timeframe:</b> 3-4 class periods			
<b>Lesson Components</b>							
<b>*21<sup>st</sup> Century Themes</b>							
	Global Awareness		Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy		Health Literacy
<b>*21<sup>st</sup> Century Skills</b>							
x	Creativity and Innovation	x	Critical Thinking and Problem Solving	x	Communication and Collaboration		Information Literacy
	Media Literacy		ICT Literacy	x	Life and Career Skills		
<b>*Interdisciplinary Connections: see unit overview</b>							

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**\*Integration of Technology:** Pearson Interactive Science Program

**\*Equipment needed:** see teacher's edition

**\*Vocabulary:** see unit overview for all vocabulary associated with this unit

Learning Outcomes	Learning Activities/Instructional Strategies
<p>Students Will Be Able To:</p> <ul style="list-style-type: none"><li>recognize basic properties of matter</li></ul>	<p><b>Lesson Sequence</b></p> <ol style="list-style-type: none"><li><b>Engage:</b><ol style="list-style-type: none"><li>Students describe what allows a blimp to float.</li><li>Introduce lesson vocabulary.</li></ol></li><li><b>Explore It! <i>What are some properties of solids?</i></b></li><li><b>Explain:</b><ol style="list-style-type: none"><li>Review lesson question.</li><li>Students read <i>Color, Mass, Volume, Temperature, and Texture</i> then answer questions using reading strategies.</li></ol></li><li><b>Lightning Lab: <i>Do I Need a Thermometer?</i></b><ol style="list-style-type: none"><li>Students rub a few drops of water and a few drops of cooking oil on the back of their hands to determine each material's temperature.</li></ol></li><li><b>Elaborate:</b><ol style="list-style-type: none"><li>Students identify prefixes in <i>milliliter</i> and <i>kiloliter</i> and tell which is greater 1mL or 1 kL.</li></ol></li><li><b>Evaluate:</b><ol style="list-style-type: none"><li>Review lesson vocabulary</li><li>Students complete the Lesson Check blackline master to determine whether they need additional help with lesson content.</li></ol></li></ol>
<p><b>Differentiation:</b></p> <p>Embedded in the program are</p> <ul style="list-style-type: none"><li>strategies for English Language Learners</li><li>leveled readers</li><li>resources to address multiple intelligences</li></ul>	
<p><b>Resources Provided:</b> <i>Pearson Interactive Science</i></p>	

### Properties of Matter: Lesson 3

**Content Area:** Science

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<b>Lesson Title:</b> <i>What Are Solids, Liquids, and Gases?</i>				<b>Timeframe:</b> 3-4 class periods			
<b>Lesson Components</b>							
<b><u>*21<sup>st</sup> Century Themes</u></b>							
	Global Awareness		Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy		Health Literacy
<b><u>*21<sup>st</sup> Century Skills</u></b>							
x	Creativity and Innovation	x	Critical Thinking and Problem Solving	x	Communication and Collaboration		Information Literacy
	Media Literacy		ICT Literacy	x	Life and Career Skills		
<b>*Interdisciplinary Connections: see unit overview</b>							
<b>*Integration of Technology: Pearson Interactive Science Program</b>							
<b>*Equipment needed: see teacher's edition</b>							
<b>*Vocabulary: see unit overview for all vocabulary associated with this unit</b>							

Learning Outcomes	Learning Activities/Instructional Strategies
<p>Students Will Be Able To:</p> <ul style="list-style-type: none"> <li>● describe properties of states of matter and identify phase changes</li> </ul>	<p><b>Lesson Sequence</b></p> <ol style="list-style-type: none"> <li>1. <b>Engage:</b> <ol style="list-style-type: none"> <li>a. Students describe how solids, liquids, and gases appear.</li> <li>b. Introduce lesson vocabulary.</li> </ol> </li> <li>2. <b>Explore It! <i>How can water change state?</i></b></li> <li>3. <b>Explain:</b> <ol style="list-style-type: none"> <li>a. Review lesson question.</li> <li>b. Students read <i>States of Matter, Freezing and Melting, Evaporation, and Condensation</i> then answer questions using reading strategies.</li> </ol> </li> <li>4. <b>Lightning Lab: <i>Wandering Ice</i></b> <ol style="list-style-type: none"> <li>a. Students place an ice cube in a tray and observe how long it takes to melt and then evaporate.</li> </ol> </li> <li>5. <b>Math Connection</b> <ol style="list-style-type: none"> <li>a. Students read a chart that shows the temperatures at which five different substances change form.</li> </ol> </li> <li>6. <b>Elaborate:</b> <ol style="list-style-type: none"> <li>a. Students learn that drivers in cold climates put alcohol-based liquid in their car to clean the windshield. Students tell how the alcohol keep</li> </ol> </li> </ol>

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	<p style="text-align: right;">the water in the cleaning fluid from freezing.</p> <p><b>7. Evaluate:</b></p> <ol style="list-style-type: none"> <li>a. Review lesson vocabulary</li> <li>b. Students complete the Lesson Check blackline master to determine whether they need additional help with lesson content.</li> </ol>
<p><b>Differentiation:</b> Embedded in the program are</p> <ul style="list-style-type: none"> <li>• strategies for English Language Learners</li> <li>• leveled readers</li> <li>• resources to address multiple intelligences</li> </ul>	
<p><b>Resources Provided:</b> <i>Pearson Interactive Science</i></p>	

<b>Properties of Matter: Lesson 4</b>							
<b>Content Area: Science</b>							
<b>Lesson Title:</b> <i>What Are Mixtures and Solutions?</i>				<b>Timeframe:</b> 3-4 class periods			
<b>Lesson Components</b>							
<b>*<u>21<sup>st</sup> Century Themes</u></b>							
	Global Awareness		Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy		Health Literacy
<b>*<u>21<sup>st</sup> Century Skills</u></b>							
x	Creativity and Innovation	x	Critical Thinking and Problem Solving	x	Communication and Collaboration		Information Literacy
	Media Literacy		ICT Literacy	x	Life and Career Skills		
<b>*Interdisciplinary Connections: see unit overview</b>							
<b>*Integration of Technology: Pearson Interactive Science Program</b>							
<b>*Equipment needed: see teacher's edition</b>							
<b>*Vocabulary: see unit overview for all vocabulary associated with this unit</b>							

Learning Outcomes	Learning Activities/Instructional Strategies
<p>Students Will Be Able To:</p> <ul style="list-style-type: none"> <li>• describe properties of solutions and explain that mixtures can be separated based on properties of their parts</li> </ul>	<p><b>Lesson Sequence</b></p> <ol style="list-style-type: none"> <li><b>1. Engage:</b> <ol style="list-style-type: none"> <li>a. Students describe parts of a mixture.</li> <li>b. Introduce lesson vocabulary.</li> </ol> </li> </ol>

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## 5th Grade Wandell School Science Curricula

Aligned to the Next Generation Science Standards (NGSS)

**ENGAGING STUDENTS • FOSTERING ACHIEVEMENT • CULTIVATING 21<sup>ST</sup> CENTURY GLOBAL SKILLS**

	<ol style="list-style-type: none"> <li>2. <b>Explore It!</b> <i>How can a mixture be separated?</i></li> <li>3. <b>Explain:</b> <ol style="list-style-type: none"> <li>a. Review lesson question.</li> <li>b. Students read <i>Mixtures, Separating Mixtures, Solutions, and Solubility</i> then answer questions using reading strategies.</li> </ol> </li> <li>4. <b>At-Home Lab: Mixed-Up Foods</b> <ol style="list-style-type: none"> <li>a. Students describe their two favorite mixtures to eat.</li> </ol> </li> <li>5. <b>Elaborate:</b> <ol style="list-style-type: none"> <li>a. Students learn that the following terms can be used to describe solutions: <i>saturated, concentrated, and dilute.</i></li> </ol> </li> <li>6. <b>Evaluate:</b> <ol style="list-style-type: none"> <li>a. Review lesson vocabulary</li> <li>b. Students complete the Lesson Check blackline master to determine whether they need additional help with lesson content.</li> </ol> </li> </ol>
<p><b>Differentiation:</b> Embedded in the program are</p> <ul style="list-style-type: none"> <li>• strategies for English Language Learners</li> <li>• leveled readers</li> <li>• resources to address multiple intelligences</li> </ul>	
<p><b>Resources Provided:</b> <i>Pearson Interactive Science</i></p>	

Properties of Matter: Lesson 5					
<b>Content Area:</b> Science					
<b>Lesson Title:</b> <i>How Does Matter Change?</i>				<b>Timeframe:</b> 3-4 class periods	
Lesson Components					
*21 <sup>st</sup> Century Themes					
	Global Awareness		Financial, Economic, Business, and Entrepreneurial Literacy	Civic Literacy	Health Literacy
*21 <sup>st</sup> Century Skills					
x	Creativity and Innovation	x	Critical Thinking and Problem Solving	x	Communication and Collaboration
	Media Literacy		ICT Literacy	x	Life and Career Skills
<b>*Interdisciplinary Connections: see unit overview</b>					

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**\*Integration of Technology:** Pearson Interactive Science Program

**\*Equipment needed:** see teacher's edition

**\*Vocabulary:** see unit overview for all vocabulary associated with this unit

Learning Outcomes	Learning Activities/Instructional Strategies
<p>Students Will Be Able To:</p> <ul style="list-style-type: none"> <li>● recognize that many physical and chemical changes are affected by temperature</li> </ul>	<p><b>Lesson Sequence</b></p> <ol style="list-style-type: none"> <li>1. <b>Engage:</b> <ol style="list-style-type: none"> <li>a. Students describe the physical changes that occur when an orange is peeled.</li> <li>b. Introduce lesson vocabulary.</li> </ol> </li> <li>2. <b>Explore It! <i>What happens when air heats up?</i></b></li> <li>3. <b>Explain:</b> <ol style="list-style-type: none"> <li>a. Review lesson question.</li> <li>b. Students read <i>Physical Changes, Temperature and Physical Changes, Chemical Changes, and Temperature and Chemical Changes</i> then answer questions using reading strategies.</li> </ol> </li> <li>4. <b>At-Home Lab: <i>Twin Balloons</i></b> <ol style="list-style-type: none"> <li>a. Students blow up two balloons, keeping one in the refrigerator and one at room temperature for one hour.</li> </ol> </li> <li>5. <b>Lightning Lab: <i>Comparing Apples and Lemons?</i></b> <ol style="list-style-type: none"> <li>a. Students use apple slices and lemon juice to observe a chemical change.</li> </ol> </li> <li>6. <b>Elaborate:</b> <ol style="list-style-type: none"> <li>a. <b>Science Notebook:</b> Students write about a time they caused a physical change in a substance.</li> </ol> </li> <li>7. <b>Evaluate:</b> <ol style="list-style-type: none"> <li>a. Review lesson vocabulary</li> <li>b. Students complete the Lesson Check blackline master to determine whether they need additional help with lesson content.</li> </ol> </li> </ol>
<p><b>Differentiation:</b></p> <p>Embedded in the program are</p> <ul style="list-style-type: none"> <li>● strategies for English Language Learners</li> <li>● leveled readers</li> <li>● resources to address multiple intelligences</li> </ul>	
<p><b>Resources Provided:</b> <i>Pearson Interactive Science</i></p>	

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Forces and Motion: Lesson 1					
<b>Content Area: Science</b>					
<b>Lesson Title:</b> <i>What Are Forces?</i>				<b>Timeframe:</b> 3-4 class periods	
Lesson Components					
<b><u>*21<sup>st</sup> Century Themes</u></b>					
	Global Awareness		Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy
					Health Literacy
<b><u>*21<sup>st</sup> Century Skills</u></b>					
x	Creativity and Innovation	x	Critical Thinking and Problem Solving	x	Communication and Collaboration
					Information Literacy
	Media Literacy		ICT Literacy	x	Life and Career Skills
<b>*Interdisciplinary Connections: see unit overview</b>					
<b>*Integration of Technology: Pearson Interactive Science Program</b>					
<b>*Equipment needed: see teacher's edition</b>					
<b>*Vocabulary: see unit overview for all vocabulary associated with this unit</b>					

Learning Outcomes	Learning Activities/Instructional Strategies
Students Will Be Able To: <ul style="list-style-type: none"> <li>● describe some forces that cause objects to move</li> </ul>	<b>Lesson Sequence</b> <ol style="list-style-type: none"> <li>1. <b>Engage:</b> <ol style="list-style-type: none"> <li>a. Students explain why a metal ring near a magnet does not fall.</li> <li>b. Introduce lesson vocabulary.</li> </ol> </li> <li>2. <b>Explore: My Planet Diary Misconception</b></li> <li>3. <b>Explain:</b> <ol style="list-style-type: none"> <li>a. Review lesson question.</li> </ol> </li> </ol>

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	<p>b. Students read <i>Forces</i>, <i>Contact Forces</i>, and <i>Non-Contact Forces</i> then answer questions using reading strategies.</p> <p>4. <b>At-Home Lab: <i>Does Gravity Affect You?</i></b></p> <p>a. Students hold one hand above their head while the other hand stays at their side, then compare the color of their palms.</p> <p>5. <b>Elaborate:</b></p> <p>a. <b>Science Notebook:</b> Students use a model car and a ramp to experiment with air resistance.</p> <p>6. <b>Evaluate:</b></p> <p>a. Review lesson vocabulary</p> <p>b. Students complete the Lesson Check blackline master to determine whether they need additional help with lesson content.</p>
<p><b>Differentiation:</b> Embedded in the program are</p> <ul style="list-style-type: none"> <li>● strategies for English Language Learners</li> <li>● leveled readers</li> <li>● resources to address multiple intelligences</li> </ul>	
<p><b>Resources Provided:</b> <i>Pearson Interactive Science</i></p>	

<b>Forces and Motion: Lesson 2</b>							
<b>Content Area: Science</b>							
<b>Lesson Title:</b> <i>What Are Newton's Laws?</i>				<b>Timeframe:</b> 3-4 class periods			
<b>Lesson Components</b>							
<b>*21<sup>st</sup> Century Themes</b>							
	Global Awareness		Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy		Health Literacy
<b>*21<sup>st</sup> Century Skills</b>							
x	Creativity and Innovation	x	Critical Thinking and Problem Solving	x	Communication and Collaboration		Information Literacy
	Media Literacy		ICT Literacy	x	Life and Career Skills		
<b>*Interdisciplinary Connections: see unit overview</b>							

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**\*Integration of Technology: Pearson Interactive Science Program**

**\*Equipment needed: see teacher's edition**

**\*Vocabulary: see unit overview for all vocabulary associated with this unit**

Learning Outcomes	Learning Activities/Instructional Strategies
<p>Students Will Be Able To:</p> <ul style="list-style-type: none"><li>● understand that a given object will have more change of motion with a large force than with a small force</li><li>● understand that a given force will cause more change of motion on small masses than on large masses</li></ul>	<p><b>Lesson Sequence</b></p> <ol style="list-style-type: none"><li>1. <b>Engage:</b><ol style="list-style-type: none"><li>a. Students predict what will happen to a snowboarder heading towards a jump.</li><li>b. Introduce lesson vocabulary.</li></ol></li><li>2. <b>Explore It! <i>How can forces affect motion?</i></b></li><li>3. <b>Explain:</b><ol style="list-style-type: none"><li>a. Review lesson question.</li><li>b. Students read <i>Changes in Motion, Newton's First Law, Newton's Second Law, and Newton's Third Law</i> then answer questions using reading strategies.</li></ol></li><li>4. <b>Go Green: <i>Carry Less, Save Gas</i></b><ol style="list-style-type: none"><li>a. Students make a list of the unnecessary items they find in an adult's car and estimate the weight of each item then determine the total weight they removed from the car and calculate the percent of gasoline they can save.</li></ol></li><li>5. <b>Math Connection:</b><ol style="list-style-type: none"><li>a. Students use a formula that describes the relationship between force, mass, and acceleration.</li></ol></li><li>6. <b>Elaborate:</b><ol style="list-style-type: none"><li>a. Students use photographs to make a collage about Newton's first law.</li></ol></li><li>7. <b>Evaluate:</b><ol style="list-style-type: none"><li>a. Review lesson vocabulary</li><li>b. Students complete the Lesson Check blackline master to determine whether they need additional help with lesson content.</li></ol></li></ol>

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<b>Differentiation:</b>	
Embedded in the program are	
<ul style="list-style-type: none"> <li>● strategies for English Language Learners</li> <li>● leveled readers</li> <li>● resources to address multiple intelligences</li> </ul>	
<b>Resources Provided:</b> <i>Pearson Interactive Science</i>	

Forces and Motion: Lesson 3							
<b>Content Area: Science</b>							
<b>Lesson Title:</b> <i>What Are Machines?</i>				<b>Timeframe:</b> 3-4 class periods			
Lesson Components							
<b><u>*21<sup>st</sup> Century Themes</u></b>							
	Global Awareness		Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy		Health Literacy
<b><u>*21<sup>st</sup> Century Skills</u></b>							
x	Creativity and Innovation	x	Critical Thinking and Problem Solving	x	Communication and Collaboration		Information Literacy
	Media Literacy		ICT Literacy	x	Life and Career Skills		
<b>*Interdisciplinary Connections: see unit overview</b>							
<b>*Integration of Technology: Pearson Interactive Science Program</b>							
<b>*Equipment needed: see teacher's edition</b>							
<b>*Vocabulary: see unit overview for all vocabulary associated with this unit</b>							

Learning Outcomes	Learning Activities/Instructional Strategies
Students Will Be Able To: <ul style="list-style-type: none"> <li>● describe different kinds of machines and understand how they work</li> </ul>	<b>Lesson Sequence</b> <ol style="list-style-type: none"> <li>1. <b>Engage:</b> <ol style="list-style-type: none"> <li>a. Students draw arrows to identify how a seesaw will move if its fixed point changes.</li> <li>b. Introduce lesson vocabulary.</li> </ol> </li> </ol>

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	<ol style="list-style-type: none"> <li>2. <b>Explore It!</b> <i>What can a wheel and axle do?</i></li> <li>3. <b>Explain:</b> <ol style="list-style-type: none"> <li>a. Review lesson question.</li> <li>b. Students read <i>Simple Machines, Levers, Pulleys, Wheel and Axle, Inclined Planes, Wedges and Screws, and Complex Machines</i> then answer questions using reading strategies.</li> </ol> </li> <li>4. <b>Lightning Lab:</b> <i>Simple Machines</i> <ol style="list-style-type: none"> <li>a. Students identify six different kinds of simple machines in the classroom and explain how each machine helps a person do work.</li> </ol> </li> <li>5. <b>Elaborate:</b> <ol style="list-style-type: none"> <li>a. Students learn that a block and tackle is a type of pulley system and then determine how many newtons it would take to move a box with a block and tackle.</li> </ol> </li> <li>6. <b>Evaluate:</b> <ol style="list-style-type: none"> <li>a. Review lesson vocabulary</li> <li>b. Students complete the Lesson Check blackline master to determine whether they need additional help with lesson content.</li> </ol> </li> </ol>
<p><b>Differentiation:</b> Embedded in the program are</p> <ul style="list-style-type: none"> <li>● strategies for English Language Learners</li> <li>● leveled readers</li> <li>● resources to address multiple intelligences</li> </ul>	
<p><b>Resources Provided:</b> <i>Pearson Interactive Science</i></p>	

<b>Changing Forms of Energy: Lesson 1</b>						
<b>Content Area: Science</b>						
<b>Lesson Title:</b> <i>What is Energy?</i>			<b>Timeframe:</b> 3-4 class periods			
<b>Lesson Components</b>						
<b>*<u>21<sup>st</sup> Century Themes</u></b>						
	Global Awareness		Financial, Economic, Business, and Entrepreneurial Literacy	Civic Literacy	Health Literacy	
<b>*<u>21<sup>st</sup> Century Skills</u></b>						
x	Creativity and	x	Critical Thinking and	x	Communication	Information

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Innovation		Problem Solving		and Collaboration		Literacy
Media Literacy		ICT Literacy	x	Life and Career Skills		
<b>*Interdisciplinary Connections: see unit overview</b>						
<b>*Integration of Technology: Pearson Interactive Science Program</b>						
<b>*Equipment needed: see teacher's edition</b>						
<b>*Vocabulary: see unit overview for all vocabulary associated with this unit</b>						

Learning Outcomes	Learning Activities/Instructional Strategies
<p>Students Will Be Able To:</p> <ul style="list-style-type: none"> <li>● describe potential and kinetic energy and explain the different forms of energy into which energy can change</li> </ul>	<p><b>Lesson Sequence</b></p> <ol style="list-style-type: none"> <li>1. <b>Engage:</b> <ol style="list-style-type: none"> <li>a. Students identify the penguin with the most energy.</li> <li>b. Introduce lesson vocabulary.</li> </ol> </li> <li>2. <b>Explore: My Planet Diary <i>Let's Blog</i></b></li> <li>3. <b>Explain:</b> <ol style="list-style-type: none"> <li>a. Review lesson question.</li> <li>b. Students read <i>Energy, Potential Energy, Kinetic Energy, Energy Everywhere, and Energy Can Change Forms</i> then answer questions using reading strategies.</li> </ol> </li> <li>4. <b>Lightning Lab: <i>Rubber-Band Release</i></b> <ol style="list-style-type: none"> <li>a. Students use a rubber band to describe energy.</li> </ol> </li> <li>5. <b>Elaborate:</b> <ol style="list-style-type: none"> <li>a. <b>Science Notebook:</b> Students choose three objects in their homes that transform electricity.</li> </ol> </li> <li>6. <b>Evaluate:</b> <ol style="list-style-type: none"> <li>a. Review lesson vocabulary</li> <li>b. Students complete the Lesson Check blackline master to determine whether they need additional help with lesson content.</li> </ol> </li> </ol>

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**Differentiation:**

Embedded in the program are

- strategies for English Language Learners
- leveled readers
- resources to address multiple intelligences

**Resources Provided:** *Pearson Interactive Science*

Changing Forms of Energy: Lesson 2							
<b>Content Area: Science</b>							
<b>Lesson Title:</b> <i>What is Sound Energy?</i>				<b>Timeframe:</b> 3-4 class periods			
Lesson Components							
* <u>21<sup>st</sup> Century Themes</u>							
	Global Awareness		Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy		Health Literacy
* <u>21<sup>st</sup> Century Skills</u>							
x	Creativity and Innovation	X	Critical Thinking and Problem Solving	x	Communication and Collaboration		Information Literacy
	Media Literacy		ICT Literacy	x	Life and Career Skills		
<b>*Interdisciplinary Connections: see unit overview</b>							
<b>*Integration of Technology: Pearson Interactive Science Program</b>							
<b>*Equipment needed: see teacher's edition</b>							
<b>*Vocabulary: see unit overview for all vocabulary associated with this unit</b>							

Learning Outcomes	Learning Activities/Instructional Strategies
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<p>Students Will Be Able To:</p> <ul style="list-style-type: none"> <li>● describe sound energy</li> </ul>	<p><b>Lesson Sequence</b></p> <ol style="list-style-type: none"> <li>1. <b>Engage:</b> <ol style="list-style-type: none"> <li>a. Students discuss why strings on an instrument look different.</li> <li>b. Introduce lesson vocabulary.</li> </ol> </li> <li>2. <b>Explore It! <i>What can affect the sound made by a rubber band?</i></b></li> <li>3. <b>Explain:</b> <ol style="list-style-type: none"> <li>a. Review lesson question.</li> <li>b. Students read <i>Sound, How Sound Behaves</i>, and <i>Sound and Energy Transfer</i> then answer questions using reading strategies.</li> </ol> </li> <li>4. <b>Math Connection:</b> <ol style="list-style-type: none"> <li>a. Students estimate time and distance using the speed of sound.</li> </ol> </li> <li>5. <b>Lightning Lab: <i>The String Phone</i></b> <ol style="list-style-type: none"> <li>a. Students make and experiment with a string phone.</li> </ol> </li> <li>6. <b>Elaborate:</b> <ol style="list-style-type: none"> <li>a. Students review the meaning of the term <i>pitch</i> then make a list or draw pictures of objects that make sounds with a high or low pitch.</li> </ol> </li> <li>7. <b>Evaluate:</b> <ol style="list-style-type: none"> <li>a. Review lesson vocabulary</li> <li>b. Students complete the Lesson Check blackline master to determine whether they need additional help with lesson content.</li> </ol> </li> </ol>
<p><b>Differentiation:</b>          Embedded in the program are</p> <ul style="list-style-type: none"> <li>● strategies for English Language Learners</li> <li>● leveled readers</li> <li>● resources to address multiple intelligences</li> </ul>	
<p><b>Resources Provided:</b> <i>Pearson Interactive Science</i></p>	

<b>Changing Forms of Energy: Lesson 3</b>	
<b>Content Area: Science</b>	
<b>Lesson Title:</b> <i>What is Light Energy?</i>	<b>Timeframe:</b> 3-4 class periods
<b>Lesson Components</b>	

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<b><u>*21<sup>st</sup> Century Themes</u></b>					
	Global Awareness		Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy
					Health Literacy
<b><u>*21<sup>st</sup> Century Skills</u></b>					
x	Creativity and Innovation	x	Critical Thinking and Problem Solving	x	Communication and Collaboration
	Media Literacy		ICT Literacy	x	Life and Career Skills
<b>*Interdisciplinary Connections: see unit overview</b>					
<b>*Integration of Technology: Pearson Interactive Science Program</b>					
<b>*Equipment needed: see teacher’s edition</b>					
<b>*Vocabulary: see unit overview for all vocabulary associated with this unit</b>					

Learning Outcomes	Learning Activities/Instructional Strategies
Students Will Be Able To: <ul style="list-style-type: none"> <li>● describe light energy</li> </ul>	<b>Lesson Sequence</b> <ol style="list-style-type: none"> <li>1. <b>Engage:</b> <ol style="list-style-type: none"> <li>a. Students analyze a thermal image.</li> <li>b. Introduce lesson vocabulary.</li> </ol> </li> <li>2. <b>Explore It! <i>What are some colors in white light?</i></b></li> <li>3. <b>Explain:</b> <ol style="list-style-type: none"> <li>a. Review lesson question.</li> <li>b. Students read <i>Light, Light Waves and Color, Electromagnetic Spectrum, and Light Changes</i> then answer questions using reading strategies.</li> </ol> </li> <li>4. <b>At-Home Lab: <i>Shining Through</i></b> <ol style="list-style-type: none"> <li>a. Students go into a dark room with a flashlight and cover the bulb end with different objects.</li> </ol> </li> <li>5. <b>Elaborate:</b> <ol style="list-style-type: none"> <li>a. <b>Science Notebook:</b> Students use a mnemonic device to help them draw and label a rainbow.</li> </ol> </li> <li>6. <b>Evaluate:</b> <ol style="list-style-type: none"> <li>a. Review lesson vocabulary</li> <li>b. Students complete the Lesson Check blackline master to determine whether they need additional help with lesson content.</li> </ol> </li> </ol>

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<b>Differentiation:</b> Embedded in the program are <ul style="list-style-type: none"><li>● strategies for English Language Learners</li><li>● leveled readers</li><li>● resources to address multiple intelligences</li></ul>	
<b>Resources Provided:</b> <i>Pearson Interactive Science</i>	

### LESSON REFLECTION

Reflect on the lesson you have developed and rate the degree to which the lesson *Strongly*, *Moderately* or *Weakly* meets the criteria below.

<b>Lesson Activities:</b>	<b>Strongly</b>	<b>Moderately</b>	<b>Weakly</b>
Are challenging and require higher order thinking and problem solving skills			



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Allow for student choice			
Provide scaffolding for acquiring targeted knowledge/skills			
Integrate global perspectives			
Integrate 21 <sup>st</sup> century skills			
Provide opportunities for interdisciplinary connection and transfer of knowledge and skills			
Foster student use of technology as a tool to develop critical thinking, creativity and innovation skills			
Are varied to address different student learning styles and preferences			
Are differentiated based on student needs			
Are student-centered with teacher acting as a facilitator and co-learner during the teaching and learning process			
Provide means for students to demonstrate knowledge and skills and progress in meeting learning goals and objectives			
Provide opportunities for student reflection and self-assessment			
Provide data to inform and adjust instruction to better meet the varying needs of learners			

<b>Curriculum Design Template</b>	
<b>Content Area:</b>	
<b>Course Title:</b>	<b>Grade Level:</b>

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**5th Grade Wandell School Science Curricula**  
Aligned to the Next Generation Science Standards (NGSS)  
**ENGAGING STUDENTS • FOSTERING ACHIEVEMENT • CULTIVATING 21<sup>ST</sup> CENTURY GLOBAL SKILLS**

<b>Unit Plan 1</b>	<b>Pacing Guide</b>
<b>Unit Plan 1</b>	<b>Pacing Guide</b>
<b>Unit Plan 3</b>	<b>Pacing Guide</b>
<b>Unit Plan 4</b>	<b>Pacing Guide</b>
<b>Unit Plan 5</b>	<b>Pacing Guide</b>
<b>Unit Plan 6</b>	<b>Pacing Guide</b>
<b>Date Created:</b>	
<b>Board Approved on:</b>	