



**Science &  
Engineering**  
*Levelled Readers*



**SCIENCE SAURUS**  
A STUDENT HANDBOOK

# Science and Engineering Levelled Readers, and ScienceSaurus<sup>®</sup>:

## Correlation to Next Generation Science Standards Disciplinary Core Ideas



Meet higher standards with high-quality  
K-5 science resources from HMH<sup>®</sup>!





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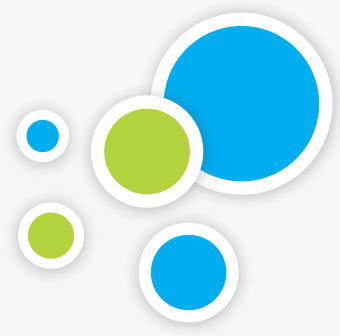
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**Science and Engineering  
Leveled Readers**

**Grade K  
Teacher Guide**  
English and Spanish



Houghton Mifflin Harcourt's new **Science and Engineering Leveled Readers** and updated **ScienceSaurus** provide content to address the Next Generation Science Standards\* (NGSS). The charts that follow—found at the front of each grade's Leveled Readers Teacher Guide—provide a correlation for both resources to the NGSS.



# Next Generation Science Standards (NGSS)

## K-PS2 Motion and Stability: Forces and Interactions

Students who demonstrate understanding can:

- K-PS2-1.** Plan and conduct an investigation to compare the effects of different strengths or different directions of pushes and pulls on the motion of an object.
- K-PS2-2.** Analyze data to determine if a design solution works as intended to change the speed or direction of an object with a push or a pull.

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<p><b>Planning and Carrying Out Investigations</b></p> <p><b>Analyzing and Interpreting Data</b></p> <p><b>Leveled Readers</b>  <b>Unit 1</b> OL/ES <i>How Do You Do Science?</i>, EN <i>How a Scientist Works</i></p> <p><b>ScienceSaurus (Yellow Level)</b>            Doing Science, Doing an Investigation, pp. 4–7            -----  <i>Connections to the Nature of Science</i></p> <p><b>Scientific Investigations Use a Variety of Methods</b></p> <p><b>Leveled Readers</b>  <b>Unit 1</b> OL/ES <i>How Do You Do Science?</i>, EN <i>How a Scientist Works</i></p> <p><b>ScienceSaurus (Yellow Level)</b>            Doing Science, Science Is Observing, pp. 2–3            Doing Science, Using Science Tools, pp. 8–11</p>	<p><b>PS2.A: Forces and Motion</b></p> <p><b>PS2.B: Types of Interactions</b></p> <p><b>PS3.C: Relationships Between Energy and Forces</b></p> <p><b>ScienceSaurus (Yellow Level)</b>            Physical Science, Motion and Forces, pp. 110–114</p> <p><b>ETS1: A Defining Engineering Problems</b></p> <p><b>Leveled Readers</b>  <b>Unit 1</b> OL/ES <i>How Can We Solve Problems?</i>, EN <i>Make a Better Bird Feeder</i></p> <p><b>ScienceSaurus (Yellow Level)</b>            Doing Science, Using the Design Process, pp. 12–15</p>	<p><b>Cause and Effect</b></p> <ul style="list-style-type: none"> <li>Simple tests can be designed to gather evidence to support or refute student ideas about causes.</li> </ul> <p><b>Leveled Readers</b>  <b>Unit 1</b> OL/ES <i>How Do You Do Science?</i>, EN <i>How a Scientist Works</i></p> <p><b>ScienceSaurus (Yellow Level)</b>            Doing Science, Doing an Investigation, pp. 4–7            Physical Science, Motion and Forces, pp. 110–114</p>

## K-PS3 Energy

Students who demonstrate understanding can:

- K-PS3-1.** Make observations to determine the effect of sunlight on Earth's surface.
- K-PS3-2.** Use tools and materials to design and build a structure that will reduce the warming effect of sunlight on an area.

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<p><b>Planning and Carrying Out Investigations</b></p> <p><b>Constructing Explanations and Designing Solutions</b></p> <p><b>Leveled Readers</b>  <b>Unit 1</b> OL/ES <i>How Do You Do Science?</i>, EN <i>How a Scientist Works</i>  <b>Unit 2</b> OL/ES <i>How Can We Solve Problems?</i>, EN <i>Make a Better Bird Feeder</i></p> <p><b>ScienceSaurus (Yellow Level)</b>            Doing Science, Science Is Observing, pp. 2–3            Doing Science, Using Science Tools, pp. 8–11            Doing Science, Using the Design Process, pp. 12–15            -----  <i>Connections to Nature of Science</i></p> <p><b>Scientific Investigations Use a Variety of Methods</b></p> <p><b>Leveled Readers</b>  <b>Unit 1</b> OL/ES <i>How Do You Do Science?</i>, EN <i>How a Scientist Works</i></p> <p><b>ScienceSaurus (Yellow Level)</b>            Doing Science, Using Science Tools, pp. 8–11</p>	<p><b>PS3.B: Conservation of Energy and Energy Transfer</b></p> <p><b>ScienceSaurus (Yellow Level)</b>            Physical Science, Energy, pp. 104–109</p>	<p><b>Cause and Effect</b></p> <ul style="list-style-type: none"> <li>Events have causes that generate observable patterns</li> </ul> <p><b>ScienceSaurus (Yellow Level)</b>            Physical Science, Energy, pp. 104–109</p>

## K-LS1 From Molecules to Organisms: Structures and Processes

Students who demonstrate understanding can:

**K-LS1-1.** Use observations to describe patterns of what plants and animals (including humans) need to survive.

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<p><b>Analyzing and Interpreting Data</b></p> <p><b>Leveled Readers</b>  <b>Unit 1</b> OL/ES <i>How Do You Do Science?</i>, EN <i>How a Scientist Works</i></p> <p><b>ScienceSaurus (Yellow Level)</b>                      Doing Science, Science Is Observing, pp. 2–3                      -----  <i>Connections to Nature of Science</i></p> <p><b>Scientific Knowledge is Based on Empirical Evidence</b></p> <p><b>Leveled Readers</b>  <b>Unit 1</b> OL/ES <i>How Do You Do Science?</i>, EN <i>How a Scientist Works</i></p> <p><b>ScienceSaurus (Yellow Level)</b>                      Doing Science, Science Is Observing, pp. 2–3</p>	<p><b>LS1.C: Organization for Matter an Energy Flow in Organisms</b></p> <p><b>Leveled Readers</b>  <b>Unit 9</b> OL/ES <i>What Can We Learn About Animals?</i>  <b>Unit 10</b> OL/ES <i>What Are Plants?</i>, EN <i>Inside a Seed</i></p> <p><b>ScienceSaurus (Yellow Level)</b>                      Life Science, What Plants Need, pp. 21–22                      Life Science, What Animals Need, pp. 29–31</p>	<p><b>Patterns</b>                      • Patterns in the natural and human designed world can be observed and used as evidence.</p> <p><b>Leveled Readers</b>  <b>Unit 1</b> OL/ES <i>How Do You Do Science?</i>, EN <i>How a Scientist Works</i>  <b>Unit 9</b> OL/ES <i>What Can We Learn About Animals?</i>, EN <i>Animal Groups</i>  <b>Unit 10</b> OL/ES <i>What Are Plants?</i>, EN <i>Inside a Seed</i></p> <p><b>ScienceSaurus (Yellow Level)</b>                      Life Science, What Plants Need, pp. 21–22                      Life Science, What Animals Need, pp. 29–31</p>

## K-ESS2 Earth's Systems

Students who demonstrate understanding can:

**K-ESS2-1.** Use and share observations of local weather conditions to describe patters over time.

**K-ESS2-2.** Construct an argument supported by evidence for how plants and animals (including humans) can change the environment to meet their needs.

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<p><b>Analyzing and Interpreting Data</b></p> <p><b>Engaging in Argument from Evidence</b></p> <p><b>Leveled Readers</b>  <b>Unit 1</b> OL/ES <i>How Do You Do Science?</i>, EN <i>How a Scientist Works</i></p> <p><b>ScienceSaurus (Yellow Level)</b>                      Doing Science, Science Is Observing, pp. 2–3                      -----  <i>Connections to Nature of Science</i></p> <p><b>Science Knowledge is Based on Empirical Evidence</b></p> <p><b>Unit 1</b> OL/ES <i>How Do You Do Science?</i>, EN <i>How a Scientist Works</i>                      Doing Science, Science Is Observing, pp. 2–3</p>	<p><b>ESS2.D: Weather and Climate</b></p> <p><b>ESS2.E: Biogeology</b></p> <p><b>ESS2.E: Human Impacts on Earth Systems</b></p> <p><b>Leveled Readers</b>  <b>Unit 6</b> OL/ES <i>What Are Some Natural Resources?</i>, EN <i>Saving Water</i>  <b>Unit 7</b> OL/ES <i>How Can We Describe Weather and Seasons?</i>, EN <i>Sun, Storm, Sun Again</i></p> <p><b>ScienceSaurus (Yellow Level)</b>                      Life Science, Caring for Resources, pp. 88–89</p>	<p><b>Patterns</b>                      • Patterns in the natural world can be observed, used to describe phenomena, and used as evidence.</p> <p><b>Systems and System Models</b>                      • Systems in the natural and designed world have parts that work together.</p> <p><b>Leveled Readers</b>  <b>Unit 7</b> OL/ES <i>How Can We Describe Weather and Seasons?</i>, EN <i>Sun, Storm, Sun Again</i>  <b>Unit 8</b> OL/ES <i>What Is in the Sky?</i>, EN <i>Patterns in the Sky</i></p> <p><b>ScienceSaurus (Yellow Level)</b>                      Doing Science, Science Is Observing, pp. 2–3                      Life Science, Caring for Resources, pp. 88–89</p>

## K-ESS3 Earth and Human Activity

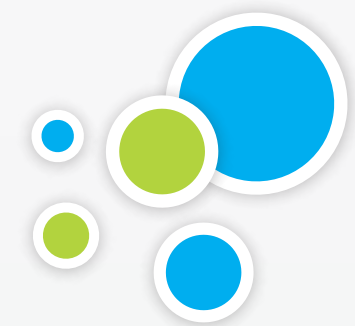
### Students who demonstrate understanding can:

- K-ESS3-1.** Use a model to represent the relationship between the needs of different plants and animals (including humans) and the places they live.
- K-ESS3-2.** Ask questions to obtain information about the purpose of weather forecasting to prepare for, and respond to, severe weather.
- K-ESS3-3.** Communicate solutions that will reduce the impact of humans on the land, water, air, and/or other living things in the local environment.

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<p><b>Asking Questions and Defining Problems</b></p> <p><b>Developing and Using Models</b></p> <p><b>Obtaining, Evaluating, and Communicating Information</b></p> <p><b>Leveled Readers</b></p> <p><b>Unit 1</b> OL/ES <i>How Do You Do Science?</i>, EN <i>How a Scientist Works</i></p> <p><b>Unit 2</b> OL/ES <i>How Can We Solve Problems?</i>, EN <i>Make a Better Bird Feeder</i></p> <p><b>ScienceSaurus (Yellow Level)</b></p> <p>Doing Science, Science Is Observing, pp. 2–3</p> <p>Doing Science, Doing an Investigation, pp. 4–7</p>	<p><b>ESS3.A: Natural Resources</b></p> <p><b>ESS3.B: Natural Hazards</b></p> <p><b>ESS3.C: Human Impacts on Earth Systems</b></p> <p><b>Leveled Readers</b></p> <p><b>Unit 6</b> OL/ES <i>What Are Some Natural Resources?</i>, EN <i>Saving Water</i></p> <p><b>Unit 7</b> OL/ES <i>How Can We Describe Weather and Seasons?</i>, EN <i>Sun, Storm, Sun Again</i></p> <p><b>ScienceSaurus (Yellow Level)</b></p> <p>Life Science, Caring for Resources, pp. 88–89</p> <p><b>ETS1.A: Defining and Delimiting an Engineering Problem</b></p> <p><b>ETS1.B: Developing Possible Solutions</b></p> <p><b>Unit 1</b> OL/ES <i>How Do You Do Science?</i>, EN <i>How a Scientist Works</i></p> <p><b>Unit 2</b> OL/ES <i>How Can We Solve Problems?</i>, EN <i>Make a Better Bird Feeder</i></p> <p><b>ScienceSaurus (Yellow Level)</b></p> <p>Doing Science, Science Is Observing, pp. 2–3</p> <p>Doing Science, Doing an Investigation, pp. 4–7</p> <p>Doing Science, Using the Design Process, pp. 12–15</p>	<p><b>Cause and Effect</b></p> <ul style="list-style-type: none"> <li>• Events have causes that generate observable patterns.</li> </ul> <p><b>Systems and System Models</b></p> <ul style="list-style-type: none"> <li>• Systems in the natural and designed world have parts that work together.</li> </ul> <p><b>Leveled Readers</b></p> <p><b>Unit 7</b> OL/ES <i>How Can We Describe Weather and Seasons?</i>, EN <i>Sun, Storm, Sun Again</i></p> <p><b>ScienceSaurus (Yellow Level)</b></p> <p>Doing Science, Science Is Observing, pp. 2–3</p> <p>-----</p> <p><i>Connections to Engineering, Technology, and Applications of Science</i></p> <p><b>Interdependence of Science, Engineering, and Technology</b></p> <ul style="list-style-type: none"> <li>• People encounter questions about the natural world every day.</li> </ul> <p><b>Influence of Engineering, Technology, and Science on Society and the Natural World</b></p> <ul style="list-style-type: none"> <li>• People depend on various technologies in their lives; human life would be very different without technology.</li> </ul> <p><b>Leveled Readers</b></p> <p><b>Unit 1</b> OL/ES <i>How Do You Do Science?</i>, EN <i>How a Scientist Works</i></p> <p><b>Unit 2</b> OL/ES <i>How Can We Solve Problems?</i>, EN <i>Make a Better Bird Feeder</i></p> <p><b>ScienceSaurus (Yellow Level)</b></p> <p>Doing Science, p. 1</p>

# Science and Engineering Leveled Readers

## Grade 1 Teacher Guide English and Spanish



# Next Generation Science Standards (NGSS)

## 1-PS4 Waves and their Applications in Technologies for Information Transfer

Students who demonstrate understanding can:

- 1-PS4-1.** Plan and conduct investigations to provide evidence that vibrating materials can make sound and that sound can make materials vibrate.
- 1-PS4-2.** Make observations to construct an evidence-based account that objects can be seen only when illuminated.
- 1-PS4-3.** Plan and conduct an investigation to determine the effect of placing objects made with different materials in the path of a beam of light.
- 1-PS4-4.** Use tools and materials to design and build a device that uses light or sound to solve the problem of communicating over a distance.

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<p><b>Planning and Carrying Out Investigations</b></p> <p><b>Constructing Explanations and Designing Solutions</b></p> <p><b>Leveled Readers</b>  <b>Unit 1</b> OL/ES <i>How Do You Investigate?</i>, EN <i>Making a Car Go Faster</i></p> <p><b>ScienceSaurus (Yellow Level)</b>                      Doing Science, Science Is Observing, pp. 2–3                      Doing Science, Doing an Investigation, pp. 4–7                      Doing Science, Using Science Tools, pp. 8–11</p> <p>-----  <i>Connections to the Nature of Science</i></p> <p><b>Scientific Investigations Use a Variety of Methods</b></p> <p><b>Leveled Readers</b>  <b>Unit 1</b> OL/ES <i>How Do You Investigate?</i>, EN <i>Making a Car Go Faster</i></p> <p><b>ScienceSaurus (Yellow Level)</b>                      Doing Science, Doing an Investigation, pp. 4–7</p>	<p><b>PS4.A: Wave Properties</b></p> <p><b>PS4.B: Electromagnetic Radiation</b></p> <p><b>PS4.C: Information Technologies and Instrumentation</b></p> <p><b>Leveled Readers</b>  <b>Unit 4</b> OL/ES <i>How What Are Forces and Energy?</i></p> <p><b>ScienceSaurus (Yellow Level)</b>                      Physical Science, Energy, pp. 104–109</p>	<p><b>Cause and Effect</b></p> <ul style="list-style-type: none"> <li>• Simple tests can be designed to gather evidence to support or refute student ideas about causes.</li> </ul> <p><b>Leveled Readers</b>  <b>Unit 1</b> OL/ES <i>How Do You Investigate?</i>, EN <i>Making a Car Go Faster</i></p> <p><b>ScienceSaurus (Yellow Level)</b>                      Doing Science, Doing an Investigation, pp. 4–7</p> <p>-----  <i>Connections to Engineering, Technology, and Applications to Science</i></p> <p><b>Influence of Engineering, Technology, and Science on Society and the Natural World</b></p> <ul style="list-style-type: none"> <li>• People depend on various technologies in their lives; human life would be very different without technology.</li> </ul> <p><b>Leveled Readers</b>  <b>Unit 2</b> OL/ES <i>How Do Engineers Solve Problems?</i></p>

## 1-LS1 From Molecules to Organisms: Structures and Processes

Students who demonstrate understanding can:

- 1-LS1-1.** Use materials to design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow, and meet their needs.
- 1-LS1-2.** Read texts and use media to determine patterns in behavior of parents and offspring that help offspring survive.

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<p><b>Constructing Explanations and Designing Solutions</b></p> <p><b>Obtaining, Evaluating, and Communicating Information</b></p> <p><b>Leveled Readers</b>  <b>Unit 1</b> OL/ES <i>How Do You Investigate?</i>, EN <i>Making a Car Go Faster</i></p> <p><b>ScienceSaurus (Yellow Level)</b>                      Doing Science, Using the Design Process, pp. 12–15</p> <p>-----  <i>Connections to Nature of Science</i></p> <p><b>Scientific Knowledge Is Based on Empirical Evidence</b></p> <p><b>Leveled Readers</b>  <b>Unit 1</b> OL/ES <i>How Do You Investigate?</i>, EN <i>Making a Car Go Faster</i></p> <p><b>ScienceSaurus (Yellow Level)</b>                      Doing Science, Science Is Observing, pp. 2–3</p>	<p><b>LS1.A: Structure and Function</b></p> <p><b>LS1.B: Growth and Development of Organisms</b></p> <p><b>LS1.D: Information Processing</b></p> <p><b>Leveled Readers</b>  <b>Unit 9</b> OL/ES <i>What Can We Learn About Animals?</i>, EN <i>Amazing Animals</i></p> <p><b>Unit 10</b> OL/ES <i>What Is a Plant?</i>, EN <i>Weird and Wacky Plants</i></p> <p><b>ScienceSaurus (Yellow Level)</b>                      Life Science, Plants, pp. 20–26                      Life Science, Animals, pp. 29–37</p> <p>-----  <i>Connections to Engineering, Technology, and Science on Society and the Natural World</i></p> <p><b>Influence of Engineering, Technology, and Science on Society and the Natural World</b></p> <ul style="list-style-type: none"> <li>• Every human-made product is designed by applying some knowledge of the natural world as is built by using natural materials.</li> </ul> <p><b>Leveled Readers</b>  <b>Unit 2</b> OL/ES <i>How Do Engineers Solve Problems?</i></p> <p><b>ScienceSaurus (Yellow Level)</b>                      Doing Science, Using the Design Process, pp. 12–15</p>	<p><b>Patterns</b></p> <ul style="list-style-type: none"> <li>• Patterns in the natural world can be observed, used to describe phenomena, and used as evidence.</li> </ul> <p><b>Structure and Function</b></p> <ul style="list-style-type: none"> <li>• The shape and stability of structures of natural and designed objects are related to their function(s).</li> </ul> <p><b>Leveled Readers</b>  <b>Unit 9</b> OL/ES <i>What Can We Learn About Animals?</i>, EN <i>Amazing Animals</i></p> <p><b>Unit 10</b> OL/ES <i>What Is a Plant?</i>, EN <i>Weird and Wacky Plants</i></p> <p><b>ScienceSaurus (Yellow Level)</b>                      Life Science, Plants, pp. 20–26                      Life Science, Animals, pp. 29–37</p> <p>-----  <i>Connections to Engineering, Technology, and Science on Society and the Natural World</i></p> <p><b>Influence of Engineering, Technology, and Science on Society and the Natural World</b></p> <ul style="list-style-type: none"> <li>• Every human-made product is designed by applying some knowledge of the natural world as is built by using natural materials.</li> </ul> <p><b>Leveled Readers</b>  <b>Unit 2</b> OL/ES <i>How Do Engineers Solve Problems?</i></p> <p><b>ScienceSaurus (Yellow Level)</b>                      Doing Science, Using the Design Process, pp. 12–15</p>

GRADE 1  
10

GRADE 1  
11

## 1-LS3 Heredity: Inheritance and Variation of Traits

Students who demonstrate understanding can:

- 1-LS3-1.** Make observations to construct an evidence-based account that young plants and animals are like, but not exactly like, their parents.

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<p><b>Constructing Explanations and Designing Solutions</b></p> <p><b>Leveled Readers</b></p> <p><b>Unit 1</b> OL/ES <i>How Do You Investigate?</i>, EN <i>Making a Car Go Faster</i></p> <p><b>ScienceSaurus (Yellow Level)</b> Doing Science, Science Is Observing, pp. 2–3</p>	<p><b>LS3.A: Inheritance of Traits</b></p> <p><b>LS3.A: Variation of Traits</b></p> <p><b>Leveled Readers</b></p> <p><b>Unit 9</b> OL/ES <i>What Can We Learn About Animals?</i>, EN <i>Amazing Animals</i></p> <p><b>Unit 10</b> OL/ES <i>What Is a Plant?</i>, EN <i>Weird and Wacky Plants</i></p> <p><b>ScienceSaurus (Yellow Level)</b> Life Science, How Plants Grow, pp. 26–28 Life Science, Animal Life Cycles, pp. 40–45</p>	<p><b>Patterns</b></p> <ul style="list-style-type: none"> <li>Patterns in the natural world can be observed, used to describe phenomena, and used as evidence.</li> </ul> <p><b>Leveled Readers</b></p> <p><b>Unit 9</b> OL/ES <i>What Can We Learn About Animals?</i>, EN <i>Amazing Animals</i></p> <p><b>Unit 10</b> OL/ES <i>What Is a Plant?</i>, EN <i>Weird and Wacky Plants</i></p> <p><b>ScienceSaurus (Yellow Level)</b> Life Science, How Plants Grow, pp. 26–28 Life Science, Animal Life Cycles, pp. 40–45</p>

## 1-ESS1 Earth's Place in the Universe

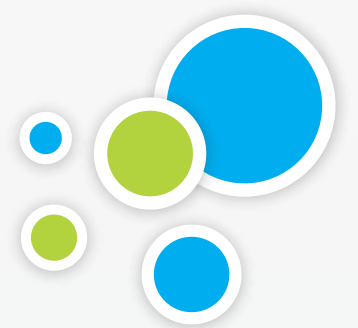
Students who demonstrate understanding can:

- 1-ESS1-1.** Use observations of the sun, moon, and stars to describe patterns that can be predicted.
- 1-ESS1-2.** Make observations at different times of year to relate the amount of daylight to the time of year.

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<p><b>Planning and Carrying Out Investigations</b></p> <p><b>Analyzing and Interpreting Data</b></p> <p><b>Leveled Readers</b></p> <p><b>Unit 1</b> OL/ES <i>How Do You Investigate?</i>, EN <i>Making a Car Go Faster</i></p> <p><b>ScienceSaurus (Yellow Level)</b> Doing Science, Science Is Observing, pp. 2–3 Doing Science, Doing an Investigation, pp. 4–7</p>	<p><b>ESS1.A: The Universe and Its Stars</b></p> <p><b>ESS1.A: Earth and the Solar System</b></p> <p><b>Leveled Readers</b></p> <p><b>Unit 7</b> OL/ES <i>How Does the Sky Seem to Change?</i>, EN <i>A Closer Look at Telescopes</i></p> <p><b>ScienceSaurus (Yellow Level)</b> Earth Science, Observing the Sky, pp. 74–75 Earth Science, Day and Night, pp. 78–79 Earth Science, Spring, p. 69 Earth Science, Summer, p. 70 Earth Science, Fall, p. 71 Earth Science, Winter, p. 72</p> <p>----- <i>Connections to Nature of Science</i></p> <p><b>Scientific Knowledge Assumes an Order and Consistency in Natural Systems</b></p> <ul style="list-style-type: none"> <li>Science assumes natural events happen today as they happened in the past.</li> <li>Many events are repeated.</li> </ul> <p><b>Leveled Readers</b></p> <p><b>Unit 7</b> OL/ES <i>How Does the Sky Seem to Change?</i>, EN <i>A Closer Look at Telescopes</i></p> <p><b>ScienceSaurus (Yellow Level)</b> Earth Science, Observing the Sky, pp. 74–75 Earth Science, Day and Night, pp. 78–79 Earth Science, Spring, p. 69 Earth Science, Summer, p. 70 Earth Science, Fall, p. 71 Earth Science, Winter, p. 72</p>	<p><b>Patterns</b></p> <ul style="list-style-type: none"> <li>Patterns in the natural world can be observed, used to describe phenomena, and used as evidence.</li> </ul> <p><b>Leveled Readers</b></p> <p><b>Unit 7</b> OL/ES <i>How Does the Sky Seem to Change?</i>, EN <i>A Closer Look at Telescopes</i></p> <p><b>ScienceSaurus (Yellow Level)</b> Earth Science, Observing the Sky, pp. 74–75 Earth Science, Day and Night, pp. 78–79 Earth Science, Spring, p. 69 Earth Science, Summer, p. 70 Earth Science, Fall, p. 71 Earth Science, Winter, p. 72</p>

# Science and Engineering Leveled Readers

**Grade 2  
Teacher Guide**  
English and Spanish





# Next Generation Science Standards (NGSS)

## 2-PS1 Matter and Its Interactions

Students who demonstrate understanding can:

- 2-PS1-1.** Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties.
- 2-PS1-2.** Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose.
- 2-PS1-3.** Make observations to construct an evidence-based account of how an object made of a small set of pieces can be disassembled and made into a new object.
- 2-PS1-4.** Construct an argument with evidence that some changes caused by heating or cooling can be reversed and some cannot.

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<p><b>Planning and Carrying Out Investigations</b></p> <p><b>Analyzing and Interpreting Data</b></p> <p><b>Constructing Explanations and Designing Solutions</b></p> <p><b>Engaging in Argument from Evidence</b></p> <p><b>Leveled Readers</b></p> <p><b>Unit 1</b> OL/ES <i>How Can I Think Like a Scientist?</i>, EN <i>How Scientists Explore Our World</i></p> <p><b>Unit 2</b> OL/ES <i>How Do Engineers Solve Problems?</i>, EN <i>Ben's Engineering Project</i></p> <p><b>ScienceSaurus (Red Level)</b></p> <p>Doing Science, Science Is Observing, pp. 2–7</p> <p>Doing Science, Doing an Investigation, pp. 8–25</p> <p>Doing Science, Using Science Tools, pp. 50–67</p> <p>-----</p> <p><i>Connections to the Nature of Science</i></p> <p><b>Science Models, Laws, Mechanisms, and Theories Explain Natural Phenomena</b></p> <p><b>Leveled Readers</b></p> <p><b>Unit 1</b> OL/ES <i>How Can I Think Like a Scientist?</i>, EN <i>How Scientists Explore Our World</i></p> <p><b>ScienceSaurus (Red Level)</b></p> <p>Doing Science, Science Is Observing, pp. 2–7</p>	<p><b>PS1.A: Structure and Properties of Matter</b></p> <p><b>PS2.B: Chemical Reactions</b></p> <p><b>Leveled Readers</b></p> <p><b>Unit 5</b> OL/ES <i>What Can We Learn About Matter?</i></p> <p><b>ScienceSaurus (Red Level)</b></p> <p>Physical Science, Matter, pp. 236–253</p>	<p><b>Patterns</b></p> <ul style="list-style-type: none"> <li>• Patterns in the natural and human designed world can be observed.</li> </ul> <p><b>Cause and Effect</b></p> <ul style="list-style-type: none"> <li>• Events have causes that generate observable patterns.</li> <li>• Simple tests can be designed to gather evidence to support or refute student ideas about causes.</li> </ul> <p><b>Energy and Matter</b></p> <ul style="list-style-type: none"> <li>• Objects may break into smaller pieces and be put together into larger pieces, or change shapes.</li> </ul> <p><b>Leveled Readers</b></p> <p><b>Unit 5</b> OL/ES <i>What Can We Learn About Matter?</i>, EN <i>Making Coins</i></p> <p><b>ScienceSaurus (Red Level)</b></p> <p>Physical Science, Matter, pp. 236–253</p> <p>-----</p> <p><i>Connections to Engineering, Technology, and Applications to Science</i></p> <p><b>Influence of Engineering, Technology, and Science on Society and the Natural World</b></p> <ul style="list-style-type: none"> <li>• Every human-made product is designed by applying some knowledge of the natural world as is built by using natural materials.</li> </ul> <p><b>Leveled Readers</b></p> <p><b>Unit 5</b> OL/ES <i>What Can We Learn About Matter?</i>, EN <i>Making Coins</i></p> <p><b>ScienceSaurus (Red Level)</b></p> <p>Physical Science, Matter, pp. 236–253</p>

## 2-LS2 Ecosystems: Interactions, Energy, and Dynamics

Students who demonstrate understanding can:

- 2-LS2-1.** Plan and conduct an investigation to determine if plants need sunlight and water to grow.
- 2-LS2-2.** Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants.

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<p><b>Developing and Using Models</b></p> <p><b>Planning and Carrying Out Investigations</b></p> <p><b>Leveled Readers</b></p> <p><b>Unit 1</b> OL/ES <i>How Can I Think Like a Scientist?</i>, EN <i>How Scientists Explore Our World</i></p> <p><b>ScienceSaurus (Red Level)</b></p> <p>Doing Science, Science Is Observing, pp. 2–7</p> <p>Doing Science, Doing an Investigation, pp. 8–25</p> <p>Doing Science, Using Science Tools, pp. 50–67</p>	<p><b>LS2.A: Independent Relationships in Ecosystems</b></p> <p><b>Leveled Readers</b></p> <p><b>Unit 8</b> OL/ES <i>What Do Plants and Animals Need?</i>, EN <i>My Science Fair Project</i></p> <p><b>Unit 9</b> OL/ES <i>How Do Living Things Survive in Their Environment?</i>, EN <i>Meet the Amazing Monarch Butterfly</i></p> <p><b>ScienceSaurus (Red Level)</b></p> <p>Life Science, What Do Plants Need, pp. 86–87</p> <p>Life Science, Living Things Need Each Other, p. 151</p> <p><b>ETS1.B: Developing Possible Solutions</b></p> <p><b>Unit 2</b> OL/ES <i>How Do Engineers Solve Problems?</i>, EN <i>Ben's Engineering Project</i></p> <p><b>ScienceSaurus (Red Level)</b></p> <p>Doing Science, Designing Technology, pp. 74–77</p>	<p><b>Cause and Effect</b></p> <ul style="list-style-type: none"> <li>• Events have causes that generate observable patterns.</li> </ul> <p><b>Structure and Function</b></p> <ul style="list-style-type: none"> <li>• The shape and stability of structures of natural and designed objects are related to their functions.</li> </ul> <p><b>Leveled Readers</b></p> <p><b>Unit 2</b> OL/ES <i>How Do Engineers Solve Problems?</i>, EN <i>Ben's Engineering Project</i></p> <p><b>Unit 8</b> OL/ES <i>What Do Plants and Animals Need?</i>, EN <i>My Science Fair Project</i></p> <p><b>Unit 9</b> OL/ES <i>How Do Living Things Survive in Their Environment?</i>, EN <i>Meet the Amazing Monarch Butterfly</i></p> <p><b>ScienceSaurus (Red Level)</b></p> <p>Life Science, What Do Plants Need, pp. 86–87</p> <p>Life Science, Living Things Need Each Other, p. 151</p> <p>Doing Science, Designing Technology, pp. 74–77</p>

## 2-LS4 Biological Evolution: Unity and Diversity

Students who demonstrate understanding can:

**2-LS4-1.** Make observations of plants and animals to compare the diversity of life in different habitats.

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<p><b>Planning and Carrying Out Investigations</b></p> <p><b>Leveled Readers</b>  <b>Unit 1</b> OL/ES <i>How Does a Scientist Investigate?</i>, EN <i>Zoom into Science</i></p> <p><b>ScienceSaurus (Red Level)</b>                      Doing Science, Science Is Observing, pp. 2–7</p> <p>-----  <i>Connections to Nature of Science</i></p> <p><b>Scientific Knowledge is Based on Empirical Evidence</b></p> <ul style="list-style-type: none"> <li>• Scientists look for patterns and order when making observations about the world.</li> </ul> <p><b>Leveled Readers</b>  <b>Unit 1</b> OL/ES <i>How Does a Scientist Investigate?</i>, EN <i>Zoom into Science</i></p> <p><b>ScienceSaurus (Red Level)</b>                      Doing Science, Science Is Observing, pp. 2–7                      Doing Science, Look at the Data, pp. 20–21</p>	<p><b>LS4.D: Biodiversity and Humans</b></p> <p><b>Leveled Readers</b>  <b>Unit 9</b> OL/ES <i>How Do Living Things Survive in Their Environment?</i>, EN <i>Meet the Amazing Monarch Butterfly</i></p> <p><b>ScienceSaurus (Red Level)</b>                      Life Science, Ecosystems, p. 129                      Life Science, Kinds of Ecosystems, pp. 130–131</p>	

## 2-ESS1 Earth's Place in the Universe

Students who demonstrate understanding can:

**2-ESS1-1.** Use information from several sources to provide evidence that Earth events can occur quickly or slowly.

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<p><b>Constructing Explanations and Designing Solutions</b></p> <p><b>Leveled Readers</b>  <b>Unit 1</b> OL/ES <i>How Does a Scientist Investigate?</i>, EN <i>Zoom into Science</i>  <b>Unit 2</b> OL/ES <i>How Do Engineers Solve Problems?</i>, EN <i>Ben's Engineering Project</i></p> <p><b>ScienceSaurus (Red Level)</b>                      Doing Science, Science Is Observing, pp. 2–7                      Doing Science, Share Your Results, p. 24</p>	<p><b>ESS1.C: The History of Planet Earth</b></p> <p><b>ScienceSaurus (Red Level)</b>                      Earth Science, Slow Changes to Earth's Surface, pp. 168–171                      Earth Science, Fast Changes to Earth's Surface, pp. 172–175</p>	<p><b>Stability and Change</b></p> <ul style="list-style-type: none"> <li>• Things may change slowly or rapidly.</li> </ul> <p><b>ScienceSaurus (Red Level)</b>                      Earth Science, Slow Changes to Earth's Surface, pp. 168–171                      Earth Science, Fast Changes to Earth's Surface, pp. 172–175</p>

## 2-ESS2 Earth's Systems

Students who demonstrate understanding can:

- 2-ESS2-1.** Compare multiple solutions designed to slow or prevent wind or water from changing the shape of the land.
- 2-ESS2-2.** Develop a model to represent the shapes and kinds of land and bodies of water in the area.
- 2-ESS2-3.** Obtain information to identify where water is found on Earth and that it can be solid or liquid.

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<p><b>Developing and Using Models</b></p> <p><b>Constructing Explanations and Designing Solutions</b></p> <p><b>Obtaining, Evaluating, and Communicating Information</b></p> <p><b>Leveled Readers</b></p> <p><b>Unit 1</b> OL/ES <i>How Can I Think Like a Scientist?</i>, EN <i>How Scientists Explore Our World</i></p> <p><b>Unit 2</b> OL/ES <i>How Do Engineers Solve Problems?</i>, EN <i>Ben's Engineering Project</i></p>	<p><b>ESS2.A: Earth Materials and Systems</b></p> <p><b>ESS2.B: Plate Tectonics and Large-Scale System Interactions</b></p> <p><b>ESS2.C: The Roles of Water in Earth's Surface Processes</b></p> <p><b>ScienceSaurus (Red Level)</b></p> <p>Earth Science, Water on Earth, p. 160</p> <p>Earth Science, Water Moves Around Earth, pp. 162–165</p> <p>Earth Science, Slow Changes to Earth's Surface, pp. 168–171</p> <p>Almanac. Maps, pp. 380–385</p> <p><b>ETS1.C: Optimizing the Design Solution</b></p> <p><b>Leveled Readers</b></p> <p><b>Unit 2</b> OL/ES <i>How Do Engineers Solve Problems?</i>, EN <i>Ben's Engineering Project</i></p> <p><b>ScienceSaurus (Red Level)</b></p> <p>Doing Science, Designing Technology, pp. 74–77</p>	<p><b>Patterns</b></p> <ul style="list-style-type: none"> <li>• Patterns in the natural world can be observed.</li> </ul> <p><b>Stability and Change</b></p> <ul style="list-style-type: none"> <li>• Things change slowly or rapidly.</li> </ul> <p><b>ScienceSaurus (Red Level)</b></p> <p>Earth Science, Water on Earth, p. 160</p> <p>Earth Science, Water Moves Around Earth, pp. 162–165</p> <p>Earth Science, Slow Changes to Earth's Surface, pp. 168–171</p> <p>-----</p> <p><i>Connections to Engineering, Technology, and Applications of Science</i></p> <p><b>Influence of Engineering, Technology, and Science on Society and the Natural World</b></p> <ul style="list-style-type: none"> <li>• Developing and using technology has impacts on the natural world.</li> </ul> <p>-----</p> <p><i>Connections to Nature of Science</i></p> <p><b>Science Addresses Questions About the Natural and Material World</b></p> <ul style="list-style-type: none"> <li>• Scientists study the natural and material world.</li> </ul> <p><b>Leveled Readers</b></p> <p><b>Unit 1</b> OL/ES <i>How Can I Think Like a Scientist?</i>, EN <i>How Scientists Explore Our World</i></p> <p><b>ScienceSaurus (Red Level)</b></p> <p>Doing Science, Science Is Observing, pp. 1–3</p>

## K-2-ETS1 Engineering Design

Students who demonstrate understanding can:

- K-2-ETS-1.** Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.
- K-2-ETS-2.** Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.
- K-2-ETS-3.** Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<p><b>Asking Questions and Defining Problems</b></p> <p><b>Developing and Using Models</b></p> <p><b>Analyzing and Interpreting Data</b></p> <p><b>Leveled Readers</b></p> <p><b>Unit 1</b> OL/ES <i>How Can I Think Like a Scientist?</i>, EN <i>How Scientists Explore Our World</i></p> <p><b>Unit 2</b> OL/ES <i>How Do Engineers Solve Problems?</i>, EN <i>Ben's Engineering Project</i></p> <p><b>ScienceSaurus (Red Level)</b></p> <p>Doing Science, Doing an Investigation, pp. 8–25</p> <p>Doing Science, Designing Technology, pp. 74–77</p>	<p><b>ETS1.A: Defining and Delimiting Engineering Problems</b></p> <p><b>ETS1.B: Developing Possible Solutions</b></p> <p><b>ETS1.C: Optimizing the Design Solution</b></p> <p><b>Leveled Readers</b></p> <p><b>Unit 2</b> OL/ES <i>How Do Engineers Solve Problems?</i>, EN <i>Ben's Engineering Project</i></p> <p><b>ScienceSaurus (Red Level)</b></p> <p>Doing Science, Doing an Investigation, pp. 8–25</p> <p>Doing Science, Designing Technology, pp. 74–77</p>	<p><b>Structure and Function</b></p> <ul style="list-style-type: none"> <li>• The shape and stability of structures of natural and designed objects are related to their function(s).</li> </ul> <p><b>Leveled Readers</b></p> <p><b>Unit 2</b> OL/ES <i>How Do Engineers Solve Problems?</i>, EN <i>Ben's Engineering Project</i></p> <p><b>ScienceSaurus (Red Level)</b></p> <p>Doing Science, Designing Technology, pp. 74–77</p>

# Science and Engineering Leveled Readers

**Grade 3  
Teacher Guide**  
English and Spanish



# Next Generation Science Standards (NGSS)

## 3-PS2 Motion and Stability: Forces and Interactions

Students who demonstrate understanding can:

- 3-PS2-1.** Plan and conduct an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object.
- 3-PS2-2.** Make observations and/or measurements of an object's motion to provide evidence that a pattern can be used to predict future motion.
- 3-PS2-3.** Ask questions to determine cause and effect relationships of electric or magnetic interactions between two objects not in contact with each other.
- 3-PS2-4.** Define a simple design problem that can be solved by applying scientific ideas about magnets.

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<p><b>Asking Questions and Defining Problems</b></p> <p><b>Planning and Carrying Out Investigations</b></p> <p><b>Leveled Readers</b>  <b>Unit 1</b> OL/ES <i>How Does a Scientist Investigate?</i>, EN <i>Zoom into Science</i></p> <p><b>ScienceSaurus (Red Level)</b>                      Doing Science, Science Is Observing, pp. 2–7                      Doing Science, Doing an Investigation, pp. 8–25                      Doing Science, Using Science Tools, pp. 50–67</p> <p>-----  <i>Connections to the Nature of Science</i></p> <p><b>Science Knowledge Is Based on Empirical Evidence</b></p> <p><b>Scientific Investigations Use a Variety of Methods</b></p> <p><b>Leveled Readers</b>  <b>Unit 1</b> OL/ES <i>How Does a Scientist Investigate?</i>, EN <i>Zoom into Science</i></p> <p><b>ScienceSaurus (Red Level)</b>                      Doing Science, Science Is Observing, pp. 2–7                      Doing Science, Using Science Tools, pp. 50–67</p>	<p><b>PS2.A: Forces and Motion</b></p> <p><b>PS2.B: Types of Interactions</b></p> <p><b>Leveled Readers</b>  <b>Unit 5</b> OL/ES <i>How Do We Use Machines?</i>, EN <i>Building with Machines</i></p> <p><b>ScienceSaurus (Red Level)</b>                      Physical Science, Motion and Forces, pp. 280–305</p>	<p><b>Patterns</b></p> <ul style="list-style-type: none"> <li>• Patterns of change can be used to make predictions.</li> </ul> <p><b>Cause and Effect</b></p> <ul style="list-style-type: none"> <li>• Cause and effect relationships are routinely identified.</li> <li>• Cause and effect relationships are routinely identified, tested, and used to explain change.</li> </ul> <p><b>Leveled Readers</b>  <b>Unit 4</b> OL/ES <i>How Do We Use Machines?</i>, EN <i>Building with Machines</i></p> <p><b>ScienceSaurus (Red Level)</b>                      Doing Science, Seeing Patterns in Data, pp. 34–35</p> <p>-----  <i>Connections to Engineering, Technology, and Applications to Science</i></p> <p><b>Interdependence of Science, Engineering, and Technology</b></p> <ul style="list-style-type: none"> <li>• Scientific discoveries about the natural world can often lead to new and improved technologies, which are developed through the engineering design process.</li> </ul> <p><b>Leveled Readers</b>  <b>Unit 2</b> OL/ES <i>What Is the Engineering Process?</i>, EN <i>Designing Amusement Park Rides</i></p> <p><b>ScienceSaurus (Red Level)</b>                      Doing Science, Science and Technology, pp. 68–77</p>

## 3-LS1 From Molecules to Organisms: Structures and Processes

Students who demonstrate understanding can:

- 3-LS1-1.** Develop models to describe that organisms have unique and diverse life cycles but all have in common birth, growth, reproduction, and death.

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<p><b>Developing and Using Models</b></p> <p><b>Leveled Readers</b>  <b>Unit 1</b> OL/ES <i>How Does a Scientist Investigate?</i>, EN <i>Zoom into Science</i>  <b>Unit 2</b> OL/ES <i>How Does the Design Process Help Us?</i>, EN <i>Designing Amusement Park Rides</i></p> <p>-----  <i>Connections to the Nature of Science</i></p> <p><b>Scientific Knowledge is Based on Empirical Evidence</b></p> <p><b>Leveled Readers</b>  <b>Unit 1</b> OL/ES <i>How Does a Scientist Investigate?</i>, EN <i>Zoom into Science</i></p> <p><b>ScienceSaurus (Red Level)</b>                      Doing Science, Science Is Observing, pp. 2–7</p>	<p><b>LS1.B: Growth and Development of Organisms</b></p> <p><b>Leveled Readers</b>  <b>Unit 11</b> OL/ES <i>How Do Living Things Change and Grow?</i>, EN <i>Surprising Adaptations</i></p> <p><b>ScienceSaurus (Red Level)</b>                      Life Science, Living Things, pp. 80–84                      Life Science, Plant Life Cycles, pp. 93–95                      Life Science, Animal Life Cycles, pp. 119–125</p>	<p><b>Patterns</b></p> <ul style="list-style-type: none"> <li>• Patterns of change can be used to make predictions.</li> </ul> <p><b>Leveled Readers</b>  <b>Unit 11</b> OL/ES <i>How Do Living Things Change and Grow?</i>, EN <i>Surprising Adaptations</i></p> <p><b>ScienceSaurus (Red Level)</b>                      Life Science, Living Things, pp. 80–84                      Life Science, Plant Life Cycles, pp. 93–95                      Life Science, Animal Life Cycles, pp. 119–125</p>

### 3-LS2 Ecosystems: Interactions, Energy, and Dynamics

Students who demonstrate understanding can:

**3-LS2-1.** Construct an argument that some animals form groups that help members survive.

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<p><b>Engaging in Argument from Evidence</b></p> <p><b>Leveled Readers</b></p> <p><b>Unit 1</b> OL/ES <i>How Does a Scientist Investigate?</i>, EN <i>Zoom into Science</i></p> <p><b>ScienceSaurus (Red Level)</b></p> <p>Doing Science, Share Your Results, p. 24</p>	<p><b>LS2.D: Social Interactions and Group Behavior</b></p> <p><b>Leveled Readers</b></p> <p><b>Unit 10</b> OL/ES <i>How Are Living Things Connected to their Ecosystem?</i>, EN <i>Rainforest Adventure</i></p> <p><b>ScienceSaurus (Red Level)</b></p> <p>Life Science, Competing for Resources, pp. 132–133</p> <p>Life Science, Behaviors Are Adaptations, pp. 140–141</p>	<p><b>Cause and Effect</b></p> <ul style="list-style-type: none"> <li>• Cause and effect relationships are routinely identified and used to explain change.</li> </ul> <p><b>Leveled Readers</b></p> <p><b>Unit 11</b> OL/ES <i>How Are Living Things Connected to their Ecosystem?</i>, EN <i>Rainforest Adventure</i></p> <p><b>ScienceSaurus (Red Level)</b></p> <p>Life Science, Competing for Resources, pp. 132–133</p> <p>Life Science, Behaviors Are Adaptations, pp. 140–141</p>

### 3-LS3 Heredity: Inheritance and Variation of Traits

Students who demonstrate understanding can:

**3-LS3-1.** Analyze and interpret data to provide evidence that plants and animals have traits inherited from parents and that variation of these traits exists in a group of similar organisms.

**3-LS3-2.** Use evidence to support the explanation that traits can be influenced by the environment.

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<p><b>Analyzing and Interpreting Data</b></p> <p><b>Constructing Explanations and Designing Solutions</b></p> <p><b>Leveled Readers</b></p> <p><b>Unit 1</b> OL/ES <i>How Does a Scientist Investigate?</i>, EN <i>Zoom into Science</i></p> <p><b>ScienceSaurus (Red Level)</b></p> <p>Doing Science, Look at the Data, pp. 20–21</p> <p>Doing Science, Draw Conclusions, pp. 22–23</p> <p>Doing Science, Share Your Results, p. 24</p>	<p><b>LS3.A: Inheritance of Traits</b></p> <p><b>LS3.B: Variation of Traits</b></p> <p><b>Leveled Readers</b></p> <p><b>Unit 11</b> OL/ES <i>How Do Living Things Change and Grow?</i>, EN <i>Surprising Adaptations</i></p> <p><b>ScienceSaurus (Red Level)</b></p> <p>Life Science, Competing for Resources, pp. 132–133</p> <p>Life Science, Adaptations Help Organisms Survive, pp. 134–135</p> <p>Life Science, Body Parts Are Adaptations, pp. 136–139</p> <p>Life Science, Behaviors Are Adaptations, pp. 140–143</p>	<p><b>Patterns</b></p> <ul style="list-style-type: none"> <li>• Similarities and differences in patterns can be used to sort and classify natural phenomena.</li> </ul> <p><b>Cause and Effect</b></p> <ul style="list-style-type: none"> <li>• Cause and effect relationships are routinely identified and used to explain change.</li> </ul> <p><b>Leveled Readers</b></p> <p><b>Unit 11</b> OL/ES <i>How Do Living Things Change and Grow?</i>, EN <i>Surprising Adaptations</i></p> <p><b>ScienceSaurus (Red Level)</b></p> <p>Life Science, Competing for Resources, pp. 132–133</p> <p>Life Science, Adaptations Help Organisms Survive, pp. 134–135</p> <p>Life Science, Body Parts Are Adaptations, pp. 136–139</p> <p>Life Science, Behaviors Are Adaptations, pp. 140–143</p>

### 3-LS4 Biological Evolution: Unity and Diversity

**Students who demonstrate understanding can:**

- 3-LS4-1.** Analyze and interpret data from fossils to provide evidence of the organisms and the environments in which they lived long ago.
- 3-LS4-2.** Use evidence to construct an explanation for how the variations in characteristics among individuals of the same species may provide advantages in surviving, finding mates, and reproducing.
- 3-LS4-3.** Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive 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 may change.

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<p><b>Analyzing and Interpreting Data</b></p> <p><b>Constructing Explanations and Designing Solutions</b></p> <p><b>Engaging in Argument from Evidence</b></p> <p><b>Leveled Readers</b>  <b>Unit 1</b> OL/ES <i>How Does a Scientist Investigate?</i>, EN <i>Zoom into Science</i></p> <p><b>ScienceSaurus (Red Level)</b>                      Doing Science, Look at the Data, pp. 20–21                      Doing Science, Draw Conclusions, pp. 22–23                      Doing Science, Share Your Results, pp. 24</p>	<p><b>LS2.C: Ecosystem Dynamics, Functioning, and Resilience</b></p> <p><b>LS4.A: Evidence of Common Ancestry and Diversity</b></p> <p><b>LS4.B: Natural Selection</b></p> <p><b>LS4.C: Adaptation</b></p> <p><b>LS4.D: Biodiversity and Humans</b></p> <p><b>Leveled Readers</b>  <b>Unit 10</b> OL/ES <i>How Are Living Things Connected to their Ecosystem?</i>, EN <i>Rainforest Adventure</i></p> <p><b>ScienceSaurus (Red Level)</b>                      Life Science, Extinct Animals, pp. 116–117                      Life Science, Nature Changes Habitats, pp. 144–145                      Life Science, People Change Habitats, pp. 146–147                      Earth Science, Fossils, pp. 186–187</p>	<p><b>Cause and Effect</b></p> <ul style="list-style-type: none"> <li>• Cause and effect relationships are routinely identified and used to explain change.</li> </ul> <p><b>Scale, Proportion, and Quantity</b></p> <ul style="list-style-type: none"> <li>• Observable phenomena exist from very short and very long time periods.</li> </ul> <p><b>Systems and System Models</b></p> <ul style="list-style-type: none"> <li>• A system can be described in terms of components and their interactions.</li> </ul> <p><b>Leveled Readers</b>  <b>Unit 10</b> OL/ES <i>How Are Living Things Connected to their Ecosystem?</i>, EN <i>Rainforest Adventure</i></p> <p><b>ScienceSaurus (Red Level)</b>                      Life Science, Extinct Animals, pp. 116–117                      Life Science, Nature Changes Habitats, pp. 144–145                      Life Science, People Change Habitats, pp. 146–147                      Earth Science, Fossils, pp. 186–187</p> <p>-----  <i>Connections to Engineering, Technology, and Applications of Science</i></p> <p><b>Interdependence of Science, Engineering, and Technology</b></p> <p>-----  <i>Connections to Nature of Science</i></p> <p><b>Scientific Knowledge Assumes and Order and Consistency in Natural Systems</b></p> <p><b>Leveled Readers</b>  <b>Unit 1</b> OL/ES <i>How Does a Scientist Investigate?</i>, EN <i>Zoom into Science</i></p>

### 3-ESS2 Earth's Systems

**Students who demonstrate understanding can:**

- 3-ESS2-1.** Represent data in tables and graphical displays to describe typical weather conditions expected during a particular season.
- 3-ESS2-2.** Obtain and combine information to describe climates in different regions of the world.

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<p><b>Analyzing and Interpreting Data</b></p> <p><b>Obtaining, Evaluating, and Communicating Information</b></p> <p><b>Leveled Readers</b>  <b>Unit 1</b> OL/ES <i>How Does a Scientist Investigate?</i>, EN <i>Zoom into Science</i></p> <p><b>ScienceSaurus (Red Level)</b>                      Doing Science, Organizing Data, pp. 26–37                      Science and Technology, Science and Technology, pp. 356–363</p>	<p><b>ESS2.D: Weather and Climate</b></p> <p><b>Leveled Readers</b>  <b>Unit 8</b> OL/ES <i>How Can We Describe Weather?</i>, EN <i>Double Danger: Thunderstorms and Tornadoes</i></p> <p><b>ScienceSaurus (Red Level)</b>                      Earth Science, Weather and Climate, pp. 188–201</p>	<p><b>Patterns</b></p> <ul style="list-style-type: none"> <li>• Patterns of change can be used to make predictions.</li> </ul> <p><b>Leveled Readers</b>  <b>Unit 8</b> OL/ES <i>How Can We Describe Weather?</i>, EN <i>Double Danger: Thunderstorms and Tornadoes</i></p> <p><b>ScienceSaurus (Red Level)</b>                      Earth Science, Weather and Climate, pp. 188–201</p>

## 3-ESS3 Earth and Human Activity

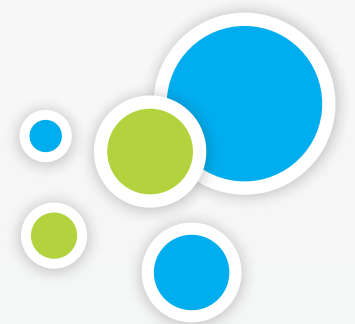
Students who demonstrate understanding can:

**3-ESS3-1.** Make a claim about the merit of a design solution that reduces the impacts of a weather-related hazard.

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<p><b>Engaging in Argument from Evidence</b></p> <p><b>Leveled Readers</b>  <b>Unit 1</b> OL/ES <i>How Does a Scientist Investigate?</i>, EN <i>Zoom into Science</i></p> <p><b>ScienceSaurus (Red Level)</b>            Doing Science, Write Down Your Observations, pp. 18–19            Doing Science, Look at the Data, pp. 20–21            Doing Science, Draw Conclusions, pp. 22–23            Doing Science, Share Your Results, p. 24</p>	<p><b>ESS3.B: Natural Hazards</b></p> <p><b>Leveled Readers</b>  <b>Unit 8</b> OL/ES <i>How Can We Describe Weather?</i>, EN <i>Double Danger: Thunderstorms and Tornadoes</i></p> <p><b>ScienceSaurus (Red Level)</b>            Earth Science, Weather and Climate, pp. 188–201</p>	<p><b>Cause and Effect</b></p> <ul style="list-style-type: none"> <li>• Cause and effect relationships are routinely identified, tested, and used to test change.</li> </ul> <p><b>Leveled Readers</b>  <b>Unit 8</b> OL/ES <i>How Can We Describe Weather?</i>, EN <i>Double Danger: Thunderstorms and Tornadoes</i></p> <p><b>ScienceSaurus (Red Level)</b>            Earth Science, Weather and Climate, pp. 188–201</p> <p>-----  <i>Connections to Engineering, Technology, and Applications of Science</i></p> <p><b>Influence of Engineering, Technology, and Science on Society and the Natural World</b></p> <ul style="list-style-type: none"> <li>• Engineers improve existing technologies or develop new ones to increase their benefits (e.g. better artificial limbs), decrease known risks (e.g. seatbelts in cars), and meet societal demands (e.g. cell phones).</li> </ul> <p>-----  <i>Connections to Nature of Science</i></p> <p><b>Science is a Human Endeavour</b></p> <ul style="list-style-type: none"> <li>• Science affects everyday life.</li> </ul> <p><b>Leveled Readers</b>  <b>Unit 1</b> OL/ES <i>How Does the Design Process Help Us?</i>, EN <i>Designing Amusement Park Rides</i></p> <p><b>ScienceSaurus (Red Level)</b>            Doing Science, Science and Technology, pp. 68–77</p>

# Science and Engineering Leveled Readers

## Grade 4 Teacher Guide English and Spanish





# Next Generation Science Standards (NGSS)

## 4-PS3 Energy

Students who demonstrate understanding can:

- 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-PS3-4.** Apply scientific ideas to design, test, and refine a device that converts energy from one form to another.

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<p><b>Asking Questions and Defining Problems</b></p> <p><b>Planning and Carrying Out Investigations</b></p> <p><b>Constructing Explanations and Designing Solutions</b></p> <p><b>Leveled Readers</b></p> <p><b>Unit 1</b> OL/ES <i>How Do We Use Scientific Investigation and Reasoning?</i>, EN <i>Wild Science: Learning from the Cheetah</i></p> <p><b>Unit 2</b> OL/ES <i>What Is the Engineering Process?</i>, EN <i>City Water Tunnel 3</i></p> <p><b>ScienceSaurus (Blue Level)</b></p> <p>Doing Science, Scientific Investigation, pp. 2–27</p> <p>Doing Science, Using Scientific Tools and Equipment, pp. 38–59</p> <p>Science, Technology, and Society, Science and Technology, pp. 356–363</p>	<p><b>PS3.A: Definitions of Energy</b></p> <p><b>PS3.B: Conservation of Energy and Energy Transfer</b></p> <p><b>PS3.C: Relationship Between Energy and Forces</b></p> <p><b>PS3.D: Energy in Chemical Processes and Everyday Life</b></p> <p><b>Leveled Readers</b></p> <p><b>Unit 4</b> OL/ES <i>How Do We Use Forms of Energy?</i>, EN <i>What Happens Under the Hood?</i></p> <p>-----</p> <p><i>Connections to Engineering, Technology, and Applications to Science</i></p> <p><b>Influence of Science, Engineering, and Technology on Society and the Natural World</b></p> <p>• Engineers improve existing technologies or develop new ones.</p> <p><b>Leveled Readers</b></p> <p><b>Unit 2</b> OL/ES <i>What Is the Engineering Process?</i>, EN <i>City Water Tunnel 3</i></p> <p>-----</p> <p><b>ScienceSaurus (Blue Level)</b></p> <p>Physical Science, Forces and Motion, pp. 268–283</p> <p>Physical Science, Energy, pp. 284–287</p> <p>Physical Science, Heat, pp. 288–294</p> <p>Physical Science, Electricity, pp. 298–303</p> <p>Physical Science, Light and Sound, pp. 308–317</p> <p><b>ETS1.A: Defining Engineering Problems</b></p> <p><b>Leveled Readers</b></p> <p>OL/ES <i>What Is the Engineering Process?</i></p> <p><b>ScienceSaurus (Blue Level)</b></p> <p>Science, Technology, and Society, Science and Technology, pp. 356–368</p>	<p><b>Energy and Matter</b></p> <p>• Energy can be transferred in various ways and between objects.</p> <p><b>Leveled Readers</b></p> <p><b>Unit 4</b> OL/ES <i>How Do We Use Forms of Energy?</i>, EN <i>What Happens Under the Hood?</i></p> <p>-----</p> <p><i>Connections to Engineering, Technology, and Applications to Science</i></p> <p><b>Influence of Science, Engineering, and Technology on Society and the Natural World</b></p> <p>• Engineers improve existing technologies or develop new ones.</p> <p><b>Leveled Readers</b></p> <p><b>Unit 2</b> OL/ES <i>What Is the Engineering Process?</i>, EN <i>City Water Tunnel 3</i></p> <p>-----</p> <p><b>ScienceSaurus (Blue Level)</b></p> <p>Science, Technology, and Society, Science and Technology, pp. 356–363</p> <p>Science, Technology, and Society, Science and Society, pp. 364–369</p> <p>-----</p> <p><i>Connections to the Nature of Science</i></p> <p><b>Science is a Human Endeavor</b></p> <p>• Most scientists and engineers work in teams.</p> <p>• Science affects everyday life.</p> <p><b>Leveled Readers</b></p> <p>OL/ES <i>How Do We Use Scientific Investigation and Reasoning?</i>, EN <i>Wild Science: Learning from the Cheetah</i></p> <p><b>ScienceSaurus (Blue Level)</b></p> <p>Science and Technology, Science and Society, pp. 364–369</p>

## 4-PS4 Waves and their Applications in Technologies for Information Transfer

Students who demonstrate understanding can:

- 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.
- 4-PS4-2.** Develop a model to describe that light reflecting from objects and entering the eye allows objects to be seen.
- 4-PS4-3.** Generate and compare multiple solutions that use patterns to transfer information.

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<p><b>Developing and Using Models</b></p> <p><b>Constructing Explanations and Designing Solutions</b></p> <p><b>Leveled Readers</b></p> <p><b>Unit 1</b> OL/ES <i>How Do We Use Scientific Investigation and Reasoning?</i></p> <p><b>Unit 2</b> OL/ES <i>What Is the Engineering Process?</i></p> <p>-----</p> <p><b>ScienceSaurus (Blue Level)</b></p> <p>Doing Science, Scientific Investigation, pp. 2–27</p> <p>Doing Science, Using Scientific Tools and Equipment, pp. 38–59</p> <p>Science and Technology, Science and Technology, pp. 356–363</p> <p>-----</p> <p><i>Connections to the Nature of Science</i></p> <p><b>Scientific Knowledge is Based on Empirical Evidence</b></p> <p><b>Leveled Readers</b></p> <p><b>Unit 1</b> OL/ES <i>How Do We Use Scientific Investigation and Reasoning?</i></p> <p><b>ScienceSaurus (Blue Level)</b></p> <p>Doing Science, Looking at Data, pp. 15–17</p>	<p><b>PS4.A: Wave Properties</b></p> <p><b>PS4.B: Electromagnetic Radiation</b></p> <p><b>PS4.C: Information Technologies and Instrumentation</b></p> <p><b>ScienceSaurus (Blue Level)</b></p> <p>Earth Science, Tsunamis, p. 182</p> <p>Earth Science, Waves and Currents, p. 194</p> <p>Physical Science, Light and Sound, pp. 308–316</p> <p><b>ETS1.C: Optimizing the Design Solution</b></p> <p><b>Leveled Readers</b></p> <p>OL/ES <i>What Is the Engineering Process?</i></p> <p><b>ScienceSaurus (Blue Level)</b></p> <p>Science, Technology, and Society, Science and Technology, pp. 356–368</p>	<p><b>Patterns</b></p> <p>• Similarities and differences in patterns can be used to sort and classify natural phenomena.</p> <p>• Similarities and differences in patterns can be used to sort and classify designed products.</p> <p><b>Cause and Effect</b></p> <p>• Cause and effect relationships are routinely identified.</p> <p><b>Leveled Readers</b></p> <p><b>Unit 1</b> OL/ES <i>How Do We Use Scientific Investigation and Reasoning?</i></p> <p>-----</p> <p><i>Connections to Engineering, Technology, and Applications of Science</i></p> <p><b>Interdependence of Science, Engineering, and Technology</b></p> <p>• Knowledge of relevant scientific concepts and research findings is important in engineering.</p> <p><b>Leveled Readers</b></p> <p>OL/ES <i>How Do We Use Scientific Investigation and Reasoning?</i>, EN <i>Wild Science: Learning from the Cheetah</i></p> <p><b>ScienceSaurus (Blue Level)</b></p> <p>Science and Technology, pp. 356–357</p>

### 4-LS1 From Molecules to Organisms: Structures and Processes

Students who demonstrate understanding can:

- 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.

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<p><b>Developing and Using Models</b></p> <p><b>Engaging in Argument from Evidence</b></p> <p><b>Leveled Readers</b></p> <p><b>Unit 1</b> OL/ES <i>How Do We Use Scientific Investigation and Reasoning?</i></p> <p><b>Unit 2</b> OL/ES <i>What Is the Engineering Process?</i></p> <p><b>ScienceSaurus (Blue Level)</b></p> <p>Doing Science, Collecting and Recording Data, pp. 10–14</p> <p>Doing Science, Looking at Data, pp. 15–17</p> <p>Doing Science, Explaining Results, pp. 18–19</p> <p>Doing Science, Sharing Results, pp. 21–27</p> <p>Science, Technology, and Society, Science and Technology, pp. 356–363</p>	<p><b>LS1.A: Structure and Function</b></p> <p><b>LS1.D: Information Processing</b></p> <p><b>Leveled Readers</b></p> <p><b>Unit 1</b> EN <i>Wild Science: Learning from the Cheetah</i></p> <p><b>Unit 10</b> OL/ES <i>How Do Organisms Interact with Their Environment?</i>, EN <i>Tiger Sharks in the Seagrass</i></p> <p><b>Unit 11</b> OL/ES <i>How Do Plants and Animals Reproduce and Adapt?</i>, EN <i>Exploring the Galapagos Islands</i></p> <p><b>ScienceSaurus (Blue Level)</b></p> <p>Life Science, Characteristics of Living Things, pp. 75–91</p> <p>Life Science, Animal and Plant Behavior, pp. 92–109</p>	<p><b>Systems and System Models</b></p> <ul style="list-style-type: none"> <li>• A system can be described in terms of its components and their interactions.</li> </ul> <p><b>Leveled Readers</b></p> <p><b>Unit 10</b> OL/ES <i>How Do Organisms Interact with Their Environment?</i>, EN <i>Tiger Sharks in the Seagrass</i></p> <p><b>Unit 11</b> OL/ES <i>How Do Plants and Animals Reproduce and Adapt?</i>, EN <i>Exploring the Galapagos Islands</i></p> <p><b>ScienceSaurus (Blue Level)</b></p> <p>Life Science, Animal and Plant Behavior, pp. 92–109</p> <p>Life Science, Ecology, pp. 126–138</p>

### 4-ESS1 Earth's Place in the Universe

Students who demonstrate understanding can:

- 4-ESS1-1.** Identify evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in a landscape over time.

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<p><b>Constructing Explanations and Designing Solutions</b></p> <p><b>Leveled Readers</b></p> <p><b>Unit 2</b> OL/ES <i>What Is the Engineering Process?</i></p> <p><b>ScienceSaurus (Blue Level)</b></p> <p>Doing Science, Collecting and Recording Data, pp. 10–14</p> <p>Doing Science, Looking at Data, pp. 15–17</p> <p>Doing Science, Explaining Results, pp. 18–19</p> <p>Doing Science, Sharing Results, pp. 21–27</p> <p>Science, Technology, and Society, Science and Technology, pp. 356–363</p>	<p><b>ESS1.C: The History of Planet Earth</b></p> <p><b>Leveled Readers</b></p> <p><b>Unit 7</b> OL/ES <i>Earth's Changing Surface and Natural Resources</i>, EN <i>Conserving Earth's Resources</i></p> <p><b>ScienceSaurus (Blue Level)</b></p> <p>Earth Science, Earth's Changing Surface, pp. 170–186</p>	<p><b>Patterns</b></p> <ul style="list-style-type: none"> <li>• Patterns can be used as evidence to support an explanation.</li> </ul> <p><b>Unit 7</b> OL/ES <i>Earth's Changing Surface and Natural Resources</i></p> <p><b>ScienceSaurus (Blue Level)</b></p> <p>Doing Science, Looking at Data, pp. 15–17</p> <p>Earth Science, Earth's Changing Surface, pp. 170–186</p> <p>-----</p> <p><i>Connections to Nature of Science</i></p> <p><b>Scientific Knowledge Assumes an Order and Consistency in Natural Systems</b></p> <ul style="list-style-type: none"> <li>• Science assumes consistent patterns in natural systems.</li> </ul> <p><b>Leveled Readers</b></p> <p><b>Unit 7</b> OL/ES <i>Earth's Changing Surface and Natural Resources</i></p> <p><b>ScienceSaurus (Blue Level)</b></p> <p>Earth Science, Earth's Changing Surface, pp. 170–186</p>

### 4-ESS2 Earth's Systems

Students who demonstrate understanding can:

- 4-ESS2-1.** Make observations and /or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation.
- 4-ESS2-2.** Analyze and interpret data from maps to describe patters of Earth's features.

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<p><b>Planning and Carrying Out Investigations</b></p> <p><b>Analyzing and Interpreting Data</b></p> <p><b>Leveled Readers</b>  <b>Unit 1</b> OL/ES <i>How Do We Use Scientific Investigation and Reasoning?</i>, EN <i>Wild Science: Learning from the Cheetah</i></p> <p><b>ScienceSaurus (Blue Level)</b>                      Scientific Investigation, Collecting and Recording Data, pp. 10–14                      Scientific Investigation, Looking at Data, pp. 15–17                      Doing Science, Using Science Tools and Equipment, pp. 38–59</p>	<p><b>ESS2.A: Earth Materials and System</b></p> <p><b>ESS2.B: Plate Tectonics and Large-Scale System Interactions</b></p> <p><b>ESS2.E: Biogeology</b></p> <p><b>Leveled Readers</b>  <b>Unit 7</b> OL/ES <i>Earth's Changing Surface and Natural Resources</i>  <b>Unit 8</b> OL/ES <i>How Does the Water Cycle Affect Weather?</i></p> <p><b>ScienceSaurus (Blue Level)</b>                      Earth Science, Earth's Changing Surface, pp. 170–186                      Earth Science, Waves and Currents, p. 194                      Earth Science, Features of the Ocean Floor, pp. 196–197                      Almanac, Map of North America, p. 406                      Almanac, Map of the World, p. 407</p>	<p><b>Patterns</b>                      • Patterns can be used as evidence to support an explanation.</p> <p><b>Cause and Effect</b>                      • Cause and effect relationships are routinely identified, tested, and used to explain change.</p> <p><b>Leveled Readers</b>  <b>Unit 7</b> OL/ES <i>Earth's Changing Surface and Natural Resources</i></p> <p><b>ScienceSaurus (Blue Level)</b>                      Earth Science, Earth's Changing Surface, pp. 170–186</p>

### 4-ESS3 Earth and Human Activity

Students who demonstrate understanding can:

- 4-ESS3-1.** Obtain and combine information to describe that energy and fuels are derived from natural resources and their uses affect the environment.
- 4-ESS3-2.** Generate and compare multiple solutions to reduce the impacts of natural Earth processes on humans.

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<p><b>Constructing Explanations and Designing Solutions</b></p> <p><b>Obtaining, Evaluating, and Communicating Information</b></p> <p><b>Leveled Readers</b>  <b>Unit 1</b> OL/ES <i>How Do We Use Scientific Investigation and Reasoning?</i>  <b>Unit 2</b> OL/ES <i>What Is the Engineering Process?</i></p> <p><b>ScienceSaurus (Blue Level)</b>                      Scientific Investigation, Collecting and Recording Data, pp. 10–14                      Science, Technology, and Society, Science and Technology, pp. 356–363</p>	<p><b>ESS3.A: Natural Resources</b></p> <p><b>ESS3.B: Natural Hazards</b></p> <p><b>Leveled Readers</b>  <b>Unit 7</b> OL/ES <i>Earth's Changing Surface and Natural Resources</i>, EN <i>Conserving Earth's Resources</i>  <b>Unit 8</b> OL/ES <i>How Does the Water Cycle Affect Weather?</i>, EN <i>Hurricane!</i></p> <p><b>ScienceSaurus (Blue Level)</b>                      Earth Science, Earth's Changing Surface, pp. 170–186                      -----  <i>Connections to Engineering, Technology, and Applications of Science</i></p> <p><b>ETS1.B: Designing Solutions to Engineering Problems</b></p> <p><b>Leveled Readers</b>  <b>Unit 2</b> OL/ES <i>What Is the Engineering Process?</i></p> <p><b>ScienceSaurus (Blue Level)</b>                      Science, Technology, and Society, Science and Technology, pp. 356–363                      Science, Technology, and Society, Science and Society, pp. 364–369</p>	<p><b>Cause and Effect</b>                      • Cause and effect relationships are routinely identified and used to explain change.                      • Cause and effect relationships are routinely identified, tested, and used to explain change.</p> <p><b>Leveled Readers</b>  <b>Unit 7</b> OL/ES <i>Earth's Changing Surface and Natural Resources</i>  <b>Unit 8</b> OL/ES <i>How Does the Water Cycle Affect Weather?</i>, EN <i>Hurricane!</i></p> <p><b>ScienceSaurus (Blue Level)</b>                      Earth Science, Earth's Changing Surface, pp. 170–186                      -----  <i>Connections to Engineering, Technology, and Applications of Science</i></p> <p><b>Interdependence of Science, Engineering, and Technology</b>                      • Knowledge of relevant scientific concepts and research findings is important in engineering.</p> <p><b>Influence of Science, Engineering, and Technology on Society and the Natural world.</b>                      • Over time, people's needs and wants change, as do their demands for new and improved technologies.                      • Engineers improve existing technologies or develop new ones to increase their benefits, to decrease known risks, and to meet societal demands.</p> <p><b>Leveled Readers</b>  <b>Unit 2</b> OL/ES <i>What Is the Engineering Process?</i>, EN <i>City Water Tunnel 3</i></p> <p><b>ScienceSaurus (Blue Level)</b>                      Science, Technology, and Society, Science and Technology, pp. 356–363                      Science, Technology, and Society, Science and Society, pp. 364–369</p>

# Science and Engineering Leveled Readers

**Grade 5  
Teacher Guide**  
English and Spanish



# Next Generation Science Standards (NGSS)

## 5-PS1 Matter and Its Interactions

Students who demonstrate understanding can:

- 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 measurements 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.

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<p><b>Developing and Using Models</b></p> <p><b>Planning and Carrying Out Investigations</b></p> <p><b>Using Mathematics and Computational Thinking</b></p> <p><b>Leveled Readers</b></p> <p><b>Unit 1</b> OL/ES <i>What Do Scientists Do?</i>, EN <i>Into the Ocean Depths</i></p> <p><b>Unit 2</b> OL/ES <i>How Do Engineers Solve Problems?</i>, EN <i>Harnessing the Wind</i></p> <p><b>ScienceSaurus (Blue Level)</b></p> <p>Doing Science, Scientific Investigation, pp. 2–27</p> <p>Doing Science, Using Scientific Tools and Equipment, pp. 38–59</p> <p>Doing Science, Using Tables and Graphs, pp. 60–73</p> <p>Almanac, Numbers in Science, pp. 371–379</p> <p>Almanac, Solving Math Problems in Science, pp. 380–385</p>	<p><b>PS1.A: Structure and Properties of Matter</b></p> <p><b>PS1.B: Chemical Reactions</b></p> <p><b>Leveled Readers</b></p> <p><b>Unit 3</b> OL/ES <i>What Are the Physical Properties of Matter?</i>, EN <i>Clean Water</i></p> <p><b>ScienceSaurus (Blue Level)</b></p> <p>Physical Science, Matter, pp. 242–259</p> <p>Physical Science, Changes in Matter, pp. 260–267</p>	<p><b>Cause and Effect</b></p> <ul style="list-style-type: none"> <li>• Cause and effect relationships are routinely identified, tested, and used to explain change.</li> </ul> <p><b>Scale, Proportion, and Quantity</b></p> <ul style="list-style-type: none"> <li>• Natural objects exist from the very small to the immensely large.</li> <li>• Standard units are used to measure and describe physical quantities such as weight, time, temperature and volume.</li> </ul> <p><b>Leveled Readers</b></p> <p><b>Unit 1</b> OL/ES <i>What Do Scientists Do?</i>, EN <i>Into the Ocean Depths</i></p> <p><b>Unit 3</b> OL/ES <i>What Are the Physical Properties of Matter?</i>, EN <i>Clean Water</i></p> <p><b>ScienceSaurus (Blue Level)</b></p> <p>Doing Science, Measuring Tools, pp. 38–50</p> <p>-----</p> <p><i>Connections to Nature of Science</i></p> <p><b>Scientific Knowledge Assumes an Order and Consistency in Natural Systems</b></p> <ul style="list-style-type: none"> <li>• Science assumes consistent patterns in natural systems.</li> </ul> <p><b>Leveled Readers</b></p> <p><b>Unit 1</b> OL/ES <i>What Do Scientists Do?</i>, EN <i>Into the Ocean Depths</i></p> <p><b>ScienceSaurus (Blue Level)</b></p> <p>Doing Science, Looking at Data, pp. 15–17</p>

## 5-PS2 Motion and Stability: Forces and Interactions

Students who demonstrate understanding can:

- 5-PS2-1.** Support an argument that the gravitational force exerted by Earth on objects is directed down.

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<p><b>Engaging in Argument from Evidence</b></p> <p><b>Leveled Readers</b></p> <p><b>Unit 1</b> OL/ES <i>What Do Scientists Do?</i>, EN <i>Into the Ocean Depths</i></p> <p><b>ScienceSaurus (Blue Level)</b></p> <p>Doing Science, Scientific Investigation, pp. 2–27</p>	<p><b>PS2.B: Types of Interactions</b></p> <p><b>Leveled Readers</b></p> <p><b>G5: Unit 4</b> OL/ES <i>How Do Forces Affect Motion?</i>, EN <i>International Space Station</i></p> <p><b>ScienceSaurus (Blue Level)</b></p> <p>Life Science, Responding to Gravity, p. 97</p> <p>Physical Science, Common Forces, pp. 270–274</p> <p>Earth Science, Gravity and Orbits, p. 227</p>	<p><b>Cause and Effect</b></p> <ul style="list-style-type: none"> <li>• Cause and effect relationships are routinely identified and used to explain change.</li> </ul> <p><b>Leveled Readers</b></p> <p><b>G5: Unit 4</b> OL/ES <i>How Do Forces Affect Motion?</i>, EN <i>International Space Station</i></p> <p><b>ScienceSaurus (Blue Level)</b></p> <p>Doing Science, Explaining Results, pp. 18–19</p>

## 5-PS3 Energy

Students who demonstrate understanding can:

**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.

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<p><b>Developing and Using Models</b></p> <p><b>Leveled Readers</b></p> <p><b>Unit 1</b> OL/ES <i>What Do Scientists Do?</i></p> <p><b>Unit 2</b> OL/ES <i>How Do Engineers Solve Problems?</i></p>	<p><b>PS3.D: Energy in Chemical Processes and Everyday Life</b></p> <p><b>LS1.C: Organization for Matter and Energy Flow in Organisms</b></p> <p><b>Leveled Readers</b></p> <p><b>Unit 11</b> OL/ES <i>How Do Organisms and Their Environment Form an Ecosystem?</i>, EN <i>Predators of Shark River</i></p> <p><b>ScienceSaurus (Blue Level)</b></p> <p>Life Science, Getting and Using Energy, pp. 77–81</p> <p>Life Science, Ecosystems, pp. 130–138</p>	<p><b>Energy and Matter</b></p> <ul style="list-style-type: none"> <li>• Energy can be transferred in various ways between objects.</li> </ul> <p><b>Leveled Readers</b></p> <p><b>Unit 11</b> OL/ES <i>How Do Organisms and Their Environment Form an Ecosystem?</i>, EN <i>Predators of Shark River</i></p> <p><b>ScienceSaurus (Blue Level)</b></p> <p>Life Science, Getting and Using Energy, pp. 77–81</p> <p>Life Science, Ecosystems, pp. 130–138</p>

## 5-LS1 From Molecules to Organisms: Structures and Processes

Students who demonstrate understanding can:

**5-LS1-1.** Support an argument that plants get the materials they need for growth chiefly from air and water.

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<p><b>Engaging in Argument from Evidence</b></p> <p><b>Leveled Readers</b></p> <p><b>Unit 1</b> OL/ES <i>What Do Scientists Do?</i>, EN <i>Into the Ocean Depths</i></p> <p><b>ScienceSaurus (Blue Level)</b></p> <p>Doing Science, Scientific Investigation, pp. 2–27</p>	<p><b>LS1.C: Organization for Matter and Energy Flow in Organisms</b></p> <p><b>Leveled Readers</b></p> <p><b>Unit 11</b> OL/ES <i>How Do Organisms and Their Environment Form an Ecosystem?</i>, EN <i>Predators of Shark River</i></p> <p><b>ScienceSaurus (Blue Level)</b></p> <p>Life Science, Photosynthesis, p. 80</p> <p>Life Science, Ecosystems, pp. 130–138</p>	<p><b>Energy and Matter</b></p> <ul style="list-style-type: none"> <li>• Matter is transported into, out of, and within systems.</li> </ul> <p><b>Leveled Readers</b></p> <p><b>Unit 11</b> OL/ES <i>How Do Organisms and Their Environment Form an Ecosystem?</i>, EN <i>Predators of Shark River</i></p> <p><b>ScienceSaurus (Blue Level)</b></p> <p>Life Science, Cells, Tissues, Organs, and Systems, pp. 99–107</p> <p>Life Science, Ecosystems, pp. 130–138</p>

### 5-LS2 Ecosystems: Interactions, Energy, and Dynamics

Students who demonstrate understanding can:

**5-LS2-1.** Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<p><b>Developing and Using Models</b></p> <p><b>Leveled Readers</b></p> <p><b>Unit 1</b> OL/ES <i>What Do Scientists Do?</i></p> <p>-----</p> <p><i>Connections to Nature of Science</i></p> <p><b>Science Models, Laws, Mechanisms, and Theories Explain Natural Phenomena</b></p> <ul style="list-style-type: none"> <li>Science explanations describe the mechanisms for natural events.</li> </ul> <p><b>Leveled Readers</b></p> <p><b>Unit 1</b> OL/ES <i>What Do Scientists Do?</i>, EN <i>Into the Depths</i></p> <p><b>ScienceSaurus (Blue Level)</b></p> <p>Doing Science, Scientific Investigation, pp. 1–22</p>	<p><b>LS2.A: Independent Relationships in Ecosystems</b></p> <p><b>LS2.B: Cycles of Matter and Energy Transfer in Ecosystems</b></p> <p><b>Leveled Readers</b></p> <p><b>Unit 11</b> OL/ES <i>How Do Organisms and Their Environment Form an Ecosystem?</i>, EN <i>Predators of Shark River</i></p> <p><b>ScienceSaurus (Blue Level)</b></p> <p>Life Science, Cells, Tissues, Organs, and Systems, pp. 99–109</p> <p>Life Science, Ecosystems, pp. 130–138</p>	<p><b>Systems and System Models</b></p> <ul style="list-style-type: none"> <li>A system can be described in terms of its components and their interactions.</li> </ul> <p><b>Leveled Readers</b></p> <p><b>Unit 11</b> OL/ES <i>How Do Organisms and Their Environment Form an Ecosystem?</i>, EN <i>Predators of Shark River</i></p> <p><b>ScienceSaurus (Blue Level)</b></p> <p>Life Science, Cells, Tissues, Organs, and Systems, pp. 99–109</p> <p>Life Science, Ecosystems, pp. 130–138</p>

### 5-ESS1 Earth's Place in the Universe

Students who demonstrate understanding can:

**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 Earth.

**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.

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<p><b>Analyzing and Interpreting Data</b></p> <p><b>Engaging in Argument from Evidence</b></p> <p><b>Leveled Readers</b></p> <p><b>Unit 1</b> OL/ES <i>What Do Scientists Do?</i>, EN <i>Into the Ocean Depths</i></p> <p><b>ScienceSaurus (Blue Level)</b></p> <p>Scientific Investigation, Collecting and Recording Data, pp. 10–14</p> <p>Scientific Investigation, Looking at Data, pp. 15–17</p> <p>Doing Science, Using Tables and Graphs, pp. 60–73</p>	<p><b>ESS1.A: The Universe and Its Stars</b></p> <p><b>ESS1.B: Earth and the Solar System</b></p> <p><b>Leveled Readers</b></p> <p><b>Unit 10</b> OL/ES <i>How Do the Sun, Earth, and Moon Move in Space?</i>, EN <i>To the Moon</i></p> <p><b>ScienceSaurus (Blue Level)</b></p> <p>Earth Science, Earth and Its Moon, pp. 218–225</p> <p>Earth Science, The Solar System and Beyond, pp. 226–239</p>	<p><b>Patterns</b></p> <ul style="list-style-type: none"> <li>Similarities and differences in patterns can be used to sort, classify, communicate and analyze simple rates of change for natural phenomena.</li> </ul> <p><b>Scale, Proportion, and Quantity</b></p> <ul style="list-style-type: none"> <li>Natural objects exist from the very small to the immensely large.</li> </ul> <p><b>Unit 10</b> OL/ES <i>How Do the Sun, Earth, and Moon Move in Space?</i>, EN <i>To the Moon</i></p> <p><b>ScienceSaurus (Blue Level)</b></p> <p>Earth Science, Earth and Its Moon, pp. 218–225</p> <p>Earth Science, The Solar System and Beyond, pp. 226–239</p>

## 5-ESS2 Earth's Systems

Students who demonstrate understanding can:

- 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 salt water and fresh water in various reservoirs to provide evidence about the distribution of water on Earth.

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<p><b>Developing and Using Models</b></p> <p><b>Using Mathematics and Computational Thinking</b></p> <p><b>Leveled Readers</b></p> <p><b>Unit 1</b> OL/ES <i>What Do Scientists Do?</i></p> <p><b>Unit 2</b> OL/ES <i>How Do Engineers Solve Problems?</i></p> <p><b>ScienceSaurus (Blue Level)</b></p> <p>Doing Science, Scientific Investigation, pp. 2–27</p> <p>Doing Science, Using Tables and Graphs, pp. 60–73</p> <p>Almanac, Numbers in Science, pp. 371–379</p> <p>Almanac, Solving Math Problems in Science, pp. 380–385</p>	<p><b>ESS2.A: Earth Materials and Systems</b></p> <p><b>ESS2.C: The Roles of Weather in Earth's Surface Processes</b></p> <p><b>Leveled Readers</b></p> <p><b>Unit 7</b> OL/ES <i>How Does Earth's Surface Change?</i></p> <p><b>Unit 9</b> OL/ES <i>How Are Climate and Weather Different?</i></p> <p><b>ScienceSaurus (Blue Level)</b></p> <p>Earth Science, Earth's Structure, pp. 158–169</p> <p>Earth Science, Earth's Changing Surface, pp. 170–183</p> <p>Earth Science, Water on Earth, pp. 187–197</p>	<p><b>Scale and Proportion</b></p> <ul style="list-style-type: none"> <li>• Standard units are used to measure and describe physical quantities such as weight and volume.</li> </ul> <p><b>Systems and System Models</b></p> <ul style="list-style-type: none"> <li>• A system can be described in terms of its components and their interactions.</li> </ul> <p><b>Leveled Readers</b></p> <p><b>Unit 7</b> OL/ES <i>How Does Earth's Surface Change?</i></p> <p><b>Unit 9</b> OL/ES <i>How Are Climate and Weather Different?</i></p> <p><b>ScienceSaurus (Blue Level)</b></p> <p>Earth Science, Earth's Structure, pp. 158–169</p> <p>Earth Science, Earth's Changing Surface, pp. 170–183</p> <p>Earth Science, Water on Earth, pp. 187–197</p>

## 5-ESS3 Earth and Human Activity

Students who demonstrate understanding can:

- 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	Disciplinary Core Ideas	Crosscutting Concepts
<p><b>Obtaining, Evaluating, and Communicating Information</b></p> <p><b>Leveled Readers</b></p> <p><b>Unit 1</b> OL/ES <i>What Do Scientists Do?</i></p> <p><b>Unit 2</b> OL/ES <i>How Do Engineers Solve Problems?</i></p> <p><b>ScienceSaurus (Blue Level)</b></p> <p>Doing Science, Scientific Investigation, pp. 2–27</p> <p>Doing Science, Using Tables and Graphs, pp. 60–73</p> <p>Almanac, Numbers in Science, pp. 371–379</p> <p>Almanac, Solving Math Problems in Science, pp. 380–385</p>	<p><b>ESS3.C: Human Impacts on Earth Systems</b></p> <p><b>Leveled Readers</b></p> <p><b>Unit 8</b> OL/ES <i>How Can Conservation Save Earth's Resources?</i>, EN <i>Alternative Energy Resources</i></p> <p><b>ScienceSaurus (Blue Level)</b></p> <p>Natural Resources and the Environment, Natural Resources, pp. 320–333</p> <p>Natural Resources and the Environment, Pollution, pp. 334–343</p> <p>Natural Resources and the Environment, Conserving Resources, pp. 344–354</p>	<p><b>Systems and System Modes</b></p> <ul style="list-style-type: none"> <li>• A system can be described in terms of its components and their interactions.</li> </ul> <p><b>Leveled Readers</b></p> <p><b>Unit 8</b> OL/ES <i>How Can Conservation Save Earth's Resources?</i>, EN <i>Alternative Energy Resources</i></p> <p><b>ScienceSaurus (Blue Level)</b></p> <p>Natural Resources and the Environment, Natural Resources, pp. 320–333</p> <p>Natural Resources and the Environment, Pollution, pp. 334–343</p> <p>Natural Resources and the Environment, Conserving Resources, pp. 344–354</p> <p style="text-align: center;">-----</p> <p style="text-align: center;"><i>Connections to Nature of Science</i></p> <p><b>Science Addresses Questions About the Natural and Material World</b></p> <ul style="list-style-type: none"> <li>• Science findings are limited to questions that can be answered with empirical evidence.</li> </ul>

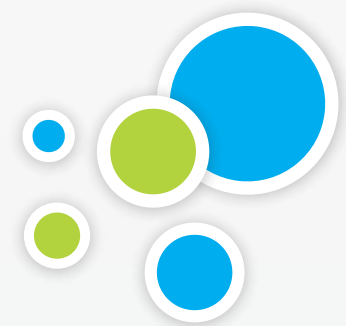


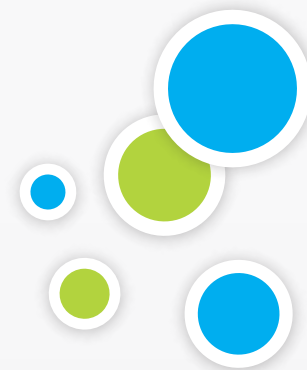
### 3-5-ETS1 Engineering Design

Students who demonstrate understanding can:

- 3-5-ETS1-1.** Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.
- 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.
- 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.

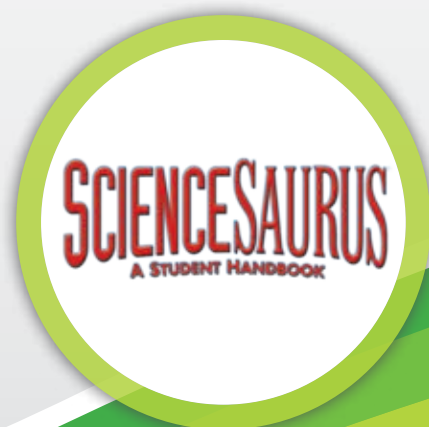
Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<p><b>Asking Questions and Defining Problems</b></p> <p><b>Planning and Carrying Out Investigations</b></p> <p><b>Constructing Explanations and Designing Solutions</b></p> <p><b>Leveled Readers</b></p> <p><b>Unit 1</b> OL/ES <i>What Do Scientists Do?</i>, EN <i>Into the Ocean Depths</i></p> <p><b>Unit 2</b> OL/ES <i>How Do Engineers Solve Problems?</i>, EN <i>Harnessing the Wind</i></p> <p><b>ScienceSaurus (Blue Level)</b></p> <p>Doing Science, Scientific Investigation, pp. 5–27</p> <p>Science and Technology, Science and Technology, pp. 356–363</p> <p>Science, Technology, and Society, Science and Technology, 356–363</p>	<p><b>ETS1.A: Defining and Delimiting Engineering Problems</b></p> <p><b>ETS1.B: Developing Possible Solutions</b></p> <p><b>ETS1.C: Optimizing the Design Solution</b></p> <p><b>Leveled Readers</b></p> <p><b>Unit 2</b> OL/ES <i>How Do Engineers Solve Problems?</i>, EN <i>Harnessing the Wind</i></p> <p><b>ScienceSaurus (Blue Level)</b></p> <p>Science and Technology, Science and Technology, pp. 356–363</p> <p>Science, Technology, and Society, Science and Technology, pp. 356–363</p>	<p><b>Influence of Engineering, Technology, and Science on Society and the Natural World</b></p> <ul style="list-style-type: none"> <li>• People’s needs and wants change over time, as do their demands for new and improved technologies.</li> <li>• Engineers improve existing technologies or develop new ones to increase their benefits, decrease known risks, and meet societal demands.</li> </ul> <p><b>Leveled Readers</b></p> <p><b>Unit 2</b> OL/ES <i>How Do Engineers Solve Problems?</i>, EN <i>Harnessing the Wind</i></p> <p><b>ScienceSaurus (Blue Level)</b></p> <p>Science and Technology, Science and Technology, pp. 356–363</p> <p>Science, Technology, and Society, Science and Technology, pp. 356–363</p> <p>Science, Technology, and Society, Science and Society, pp. 364–369</p>





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