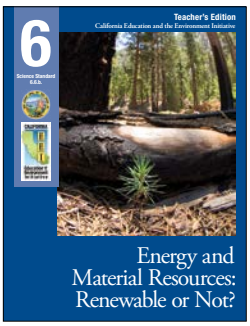
California Education and the Environment Initiative

Increasing Environmental Literacy for K–12 Students…
Because the Future is in Their Hands

TEACH COMMON CORE STANDARDS WITH THE EEI CURRICULUM

Created with your needs in mind, this document shows the correlation between the EEI Curriculum and the California Common Core State Standards. By teaching the EEI unit lessons in your classroom, you will be simultaneously addressing the Common Core standards depicted in this guide.

6.6.b.—Energy and Material Resources: Renewable or Not?



In this unit, students learn about different natural energy and material resources, including air, soil, rocks, minerals, petroleum, fresh water, wildlife, and forests, and see how to classify them as renewable or nonrenewable. Students will explore the different ways in which natural resources may be categorized and evaluated as commodities. They come to understand that ongoing use of resources is inextricably intertwined with human practices, management, and technological developments—all of which affect natural systems and human systems.

LESSONS	RI.6.1	RI.6.2	RI.6.4	RI.6.7	RH.6–8.4	RH.6–8.7	RST.6–8.1	RST.6–8.2	RST.6–8.4	RST.6–8.5	RST.6–8.7	RST.6–8.8	W.6.1	W.6.2	W.6.4	W.6.9	SL.6.1	SL.6.2	SL.6.3	SL.6.4	SL.6.5	SL.6.6	L.6.1	L.6.2	L.6.3	L.6.4
California Connections							✓	✓	✓	✓	✓															
1		✓	✓	✓	✓	✓					✓	✓					✓	✓						✓		
2			✓	✓	✓		✓										✓		✓	✓				✓		
3	✓		✓	✓	✓												✓	✓		✓	✓					✓
4		✓	✓	✓	✓	✓	✓						✓		✓	✓	✓	✓		✓		✓			✓	
5			✓	✓	✓										✓	✓	✓	✓					✓		✓	
Traditional Assessment		✓	✓	✓										✓	✓											
Alternative Assessment			✓	✓		✓					✓				✓											

COMMON CORE STANDARDS

Note: *For your reference, the list of California Common Core State Standards abbreviations is on the following page.*

Using the EEI-Common Core Correlation Matrix

The matrix on the front page identifies a number of Common Core standards that are supported by this EEI unit. However, the check marks in the matrix do not necessarily signify that the Common Core standards checked will be taught to mastery by using this EEI unit alone. Teachers are encouraged to select which Common Core standards they wish to emphasize, rather than teaching to every indicated standard. By spending more time on selected standards, students will move toward greater Common Core proficiency in comprehension, critical thinking and making reasoned arguments from evidence. Teaching this EEI unit will provide opportunities for teachers to implement the shift in instructional practice necessary for full Common Core implementation.

California Common Core State Standards Abbreviations

- **CCCSS:** California Common Core State Standards
- **L:** Language Standards
- **RH:** Reading Standards for Literacy in History/Social Studies
- **RI:** Reading Standards for Informational Text
- **RST:** Reading Literacy Standards in Science and Technical Subjects
- **SL:** Speaking and Listening Standards
- **W:** Writing Standards

Note: *Since each Common Core standard includes a breadth of skills, in this correlation, the portion of the standard description that is featured in the Common Core Standards Applications is cited, using "…" to indicate omitted phrases. For a list of the complete standard descriptions, please see the Common Core Reference Pages located on pages 18–19 of this document.*

A Note about Speaking and Listening Common Core Standards

Many of the EEI units provide various learning structures, materials, and groupings that lead toward students working in pairs or small groups to discuss concepts and ideas. This supports the skill in Speaking and Listening Standard 1 "Participate effectively in a range of collaborative discussions (one-on-one, groups…) with diverse partners." With prior instruction in collaborative discussion techniques, students can be placed in pairs or small groups to discuss the lesson topics. To aid in teacher planning, the lessons are listed below which include tasks for whole class, pairs/partners, and/or small groups:

- **Lesson 1:** Whole class, small groups, pairs, individual
- **Lesson 2:** Whole class, pairs
- **Lesson 3:** Whole class, small groups, pairs, individual
- **Lesson 4:** Whole class, small groups
- **Lesson 5:** Whole class, individual

National Geographic Resources

No maps or posters are used with this unit.

Unit Assessment Options

Assessments	Common Core Standards Applications
Traditional Assessment	
Energy and Material Resources (Traditional Unit Assessment Master) is comprised of matching, multiple-answers, listing, and short-answer questions that assess students' achievement of the unit's learning objectives.	**RI.6.2:** Determine a central idea of a text and how it is conveyed through particular details; provide a summary of the text distinct from personal opinions or judgments. **RI.6.4:** Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings… **RI.6.7:** Integrate information presented in different media or formats (e.g., visually, quantitatively) as well as in words to develop a coherent understanding of a topic or issue. **W.6.2:** Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content. **W.6.4:** Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience…
Alternative Assessment	
Students complete a poster showing their knowledge of energy and material resources. This includes drawing pictures, defining terms, and creating predictions.	**RH.6–8.7:** Integrate visual information (e.g., in charts, graphs, photographs, videos, or maps) with other information in print and digital texts. **RI.6.4:** Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings. **RI.6.7:** Integrate information presented in different media or formats (e.g., visually, quantitatively) as well as in words to develop a coherent understanding of a topic or issue. **RST.6–8.7:** Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually… **W.6.4:** Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience…

Lesson 1: What Are Resources?

In a class discussion, students list resources that natural systems provide. They then read about three material or energy resources found in California. Finally, students work in small groups to categorize the resources in the class list as a material or an energy resource.

Lesson 1

What Are Resources?

Use this correlation in conjunction with the **Procedures** located on pages 32–33 of the Teacher's Edition. Only procedure steps with a Common Core correlation are included in the table below.

Student Tasks	Common Core Standards Applications
Vocabulary Development: For depth of understanding, vocabulary may be featured within the context of the unit instead of or in addition to the beginning of the lesson.	**RH.6–8.4:** Determine the meaning of words and phrases as they are used in a text, including vocabulary specific to domains related to history/social studies. **RI.6.4:** Determine the meaning of words and phrases as they are used in a text…
Step 1: Students work in pairs to discuss what "as good as gold" means to them. Then, as a class, they create a list of everyday resources that they use, and explain how each everyday resource comes from nature. They follow this with a class discussion about **Lake by a Small Town** (Visual Aid #1).	**RH.6–8.7:** Integrate visual information… with other information in print and digital texts. **SL.6.1:** Engage effectively in a range of collaborative discussions…, building on others' ideas and expressing their own clearly.
Step 2: Individually, students identify 5 natural resources and record them in the **Resources Provided by Natural Systems Chart**.	**L.6.2:** Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing. **RST.6–8.7:** Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually…
Steps 3–5: In small groups, students read ***California Connections: As Good As Gold*** (Student Edition, pages 2–5). When finished, conduct a class discussion by analyzing the text for resource understanding. ***Suggestion:*** *Refer to the* ***Reading*** **California Connections** ***Using a Common Core Reading and Writing Focus*** *on pages 13–17 to view specific suggestions for integrating Common Core standards while reading the selection not only for content, but for text structure as well.*	**RH.6–8.4:** Determine the meaning of words and phrases as they are used in a text… **RI.6.2:** Determine a central idea of a text and how it is conveyed through particular details… **RST.6–8.8:** Distinguish among facts, reasoned judgment based on research findings, and speculation in a text. **SL.6.1:** Engage effectively in a range of collaborative discussions…, building on others' ideas and expressing their own clearly.

Student Tasks	Common Core Standards Applications
Steps 6 and 7: Using **Biomass** (Visual Aid #2), conduct a class discussion comparing material and energy resources. Then have students individually create a list of material and energy resources using the **Resources Provided by Natural Systems Chart** and the **Energy and Material Resources Table** (Student Workbook, page 2). ***Tip:*** *If* ***Student Workbooks*** *need to be reused from year to year, students should not write in them. Some strategies teachers use to preserve the workbooks are:* ■ *Have students use binder paper or other lined or unlined paper.* ■ *Have students use a sheet protector over the page and write with a whiteboard marker.* ■ *Do together as a class on a projector or chart paper.* ■ *Project the digital fill-in version and do together as a class.* ■ *Students use digital devices to fill in the digital version found on the website.* ■ *Make student copies when necessary.*	**L.6.2:** Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing. **RI.6.7:** Integrate information presented in different media or formats (e.g., visually, quantitatively) as well as in words to develop a coherent understanding of a topic or issue. **SL.6.2:** Interpret information presented in diverse media and formats…and explain how it contributes to a topic, text, or issue under study.

Lesson 2: What Do Humans Need?

Students re-categorize energy and material resources according to the perspective of what is essential to human physical survival. They record energy and material resources they use at home, and discuss that alternative resources are available to meet human needs.

Lesson 2

What Do Humans Need?

Lesson 2

Learning Objective

Background

Key Vocabulary

Use this correlation in conjunction with the **Procedures** located on pages 44–45 of the Teacher's Edition. Only procedure steps with a Common Core correlation are included in the table below.

Student Tasks	Common Core Standards Applications
Vocabulary Development: For depth of understanding, vocabulary may be featured within the context of the unit instead of or in addition to the beginning of the lesson.	**RH.6–8.4:** Determine the meaning of words and phrases as they are used in a text, including vocabulary specific to domains related to history/social studies. **RI.6.4:** Determine the meaning of words and phrases as they are used in a text…
Steps 1 and 2: Conduct a class discussion by asking, "What do humans need to survive?" Create a list on the board and then have students vote on which of those are the most *essential* things.	**SL.6.1:** Engage effectively in a range of collaborative discussions…
Step 3: Have students fill out the **Essential Resources Chart** based on answers in Steps 1 and 2.	**L.6.2:** Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing. **RI.6.7:** Integrate information presented in different media or formats (e.g., visually, quantitatively) as well as in words to develop a coherent understanding of a topic or issue.
Steps 4 and 5: Using **Energy and Material Resources Table** (Visual Aid #3), students work with a partner to discuss which resources are "essential" and argue their point.	**RST.6–8.1:** Cite specific textual evidence to support analysis of science and technical texts. **SL.6.1:** Engage effectively in a range of collaborative discussions… **SL.6.3:** Delineate a speaker's argument and specific claims, distinguishing claims that are supported by reasons and evidence from claims that are not. **SL.6.4:** Present claims and findings **(e.g., argument, narrative, informative, response to literature presentations)**…
Step 6: For homework, students fill out **Energy and Material Resources Essential at Home** (Student Workbook, pages 3–4).	**L.6.2:** Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

Lesson 3: What Makes a Resource Renewable?

Students view and discuss cartoons that depict examples of renewable resources, nonrenewable resources, and inexhaustible resources. They evaluate and discuss differences between the three resource categories. They define, describe, and provide examples of resources that fit within each category.

Lesson 3

What Makes a Resource Renewable?

Use this correlation in conjunction with the **Procedures** located on pages 54–55 of the Teacher's Edition. Only procedure steps with a Common Core correlation are included in the table below.

Student Tasks	Common Core Standards Applications
Vocabulary Development: For depth of understanding, vocabulary may be featured within the context of the unit instead of or in addition to the beginning of the lesson.	**RH.6–8.4:** Determine the meaning of words and phrases as they are used in a text, including vocabulary specific to domains related to history/social studies. **RI.6.4:** Determine the meaning of words and phrases as they are used in a text…
Steps 1–3: Using the **Renewable, Nonrenewable, and Inexhaustible Resources Chart**, students look up words in the dictionaries and share them with each other. Then they participate in a class discussion on the meaning of "essential" resources. They compare and contrast plants and animals with renewable vs. nonrenewable resources.	**L.6.4:** Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on *grade 6 reading and content*, choosing flexibly from a range of strategies. c) Consult reference materials (e.g., dictionaries…)… **RH.6–8.4:** Determine the meaning of words and phrases as they are used in a text, including vocabulary specific to domains related to history/social studies. **SL.6.1:** Engage effectively in a range of collaborative discussions…
Steps 4–6: Using **Resources Discussion Questions: Groups 1–7** (Teacher's Masters, pages 2–15), students work in 7 groups to lead class discussions based on the cartoon assigned to their group.	**RI.6.1:** Cite textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text. **RI.6.4:** Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings… **RI.6.7:** Integrate information presented in different media or formats (e.g., visually, quantitatively) as well as in words to develop a coherent understanding of a topic or issue. **SL.6.1:** Engage effectively in a range of collaborative discussions.. **SL.6.4:** Present claims and findings.

Student Tasks	Common Core Standards Applications
Steps 4–6 (Continued):	**SL.6.5:** Include multimedia components (e.g., graphics, images, music, sound) and visual displays in presentations to clarify information.
Step 7: Students participate in a class-wide guided discussion about rocks and minerals by finishing the **Renewable, Nonrenewable, and Inexhaustible Resources Chart**.	**RI.6.7:** Integrate information presented in different media or formats (e.g., visually, quantitatively) as well as in words to develop a coherent understanding of a topic or issue. **SL.6.1:** Engage effectively in a range of collaborative discussions… **SL.6.2:** Interpret information presented in diverse media and formats…
Step 8: Students begin **Renewable, Nonrenewable, and Inexhaustible Resources** (Student Workbook, page 5), and finish at home.	**RI.6.7:** Integrate information presented in different media or formats (e.g., visually, quantitatively) as well as in words to develop a coherent understanding of a topic or issue. **SL.6.2:** Interpret information presented in diverse media and formats…

Lesson 4: How Do Our Practices Affect Our Resources?

Students discuss scenarios in which consumption rates and human practices affect the population and availability of wild fish for human use. They create a decision flowchart to explore and discuss options, outcomes, and decisions related to resource availability.

Lesson 4

How Do Our Practices Affect Our Resources?

Learning Objective

Background

Key Vocabulary

Use this correlation in conjunction with the **Procedures** located on pages 84–85 of the Teacher's Edition. Only procedure steps with a Common Core correlation are included in the table below.

Student Tasks	Common Core Standards Applications
Vocabulary Development: For depth of understanding, vocabulary may be featured within the context of the unit instead of or in addition to the beginning of the lesson.	**RH.6–8.4:** Determine the meaning of words and phrases as they are used in a text, including vocabulary specific to domains related to history/social studies. **RI.6.4:** Determine the meaning of words and phrases as they are used in a text…
Steps 1 and 2: Using a pros and cons chart on the whiteboard, conduct a class discussion on the decision making process. Use students' personal contributions as examples. Then draw their attention to **Lake by a Small Town** (Visual Aid #1) and discuss the several different scenarios in **Fishing Scenarios** (Visual Aid #11). Ask, "How might people in the town solve their problem?".	**RI.6.2:** Determine a central idea of a text and how it is conveyed through particular details; provide a summary of the text distinct from personal opinions or judgments. **RI.6.7:** Integrate information presented in different media or formats (e.g., visually, quantitatively) as well as in words to develop a coherent understanding of a topic or issue. **SL.6.1:** Engage effectively in a range of collaborative discussions…
Step 3: Using **Aquaculture** (Visual Aid #2), explain to students how aquaculture could be a potential solution to the problem, then have them read the facts in **All About Aquaculture** (Student Edition, page 6). ***Suggestion:*** *Have students alternate reading the facts out loud to a partner.*	**L.6.3:** Use knowledge of language and its conventions when writing, speaking, reading, or listening. **SL.6.4:** Present claims and findings… **SL.6.6:** Adapt speech to a variety of contexts and tasks, demonstrating command of formal English when indicated or appropriate…
Steps 4 and 5: As a class, review the process of effective decision making with **Sample Decision Flowchart** (Visual Aide #12). Then have students use this model to develop alternatives to solve a real-world resource issue. Students then fill out **Sample Decision Flowchart** (Student Workbook, page 6). At the end, have the class suggest two alternatives: one that has to do with "consumption," the other, "production." ***Suggestion:*** *Split students into groups of 4 rather than holding a class-wide discussion.*	**RH.6–8.7:** Integrate visual information (e.g., in charts, graphs, photographs, videos, or maps) with other information in print and digital texts. **RST.6–8.1:** Cite specific textual evidence to support analysis of science and technical texts.

Student Tasks	Common Core Standards Applications
Steps 4 and 5 (Continued):	**SL.6.1:** Engage effectively in a range of collaborative discussions… **SL.6.2:** Interpret information presented in diverse media and formats (e.g., visually, quantitatively, orally) and explain how it contributes to a topic, text, or issue under study. **SL.6.4:** Present claims and findings…, sequencing ideas logically and using pertinent descriptions, facts, and details **and nonverbal elements** to accentuate main ideas or themes; use appropriate eye contact, adequate volume, and clear pronunciation… **W.6.9:** Draw evidence from literary or informational texts to support analysis, reflection, and research.
Step 6: Conduct a class discussion on which of the two alternatives they support and why.	**SL.6.1:** Engage effectively in a range of collaborative discussions… **SL.6.2:** Interpret information presented in diverse media and formats (e.g., visually, quantitatively, orally) and explain how it contributes to a topic, text, or issue under study. **SL.6.4:** Present claims and findings…, sequencing ideas logically and using pertinent descriptions, facts, and details **and nonverbal elements** to accentuate main ideas or themes; use appropriate eye contact, adequate volume, and clear pronunciation…
Step 7: Using the **Sample Decision Flowchart** as a guide, have students complete the **Fossil Fuels Decision Flowchart** (Student Workbook, pages 7–8) for homework.	**RST.6–8.1:** Cite specific textual evidence to support analysis of science and technical texts. **W.6.1:** Write arguments to support claims with clear reasons and relevant evidence. **W.6.4:** Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience… **W.6.9:** Draw evidence from literary or informational texts to support analysis, reflection, and research.

Lesson 5: How Do We Classify Our Resources?

Students analyze diagrams and categorize resources discussed in ***California Connections: As Good As Gold*** as renewable, nonrenewable, or inexhaustible resources. They discuss whether human practices can affect the quantity of a resource, causing it to belong in more than one category.

Lesson 5

How Do We Classify Our Resources?

Learning Objective

Background

Key Vocabulary

Use this correlation in conjunction with the **Procedures** located on pages 98–99 of the Teacher's Edition. Only procedure steps with a Common Core correlation are included in the table below.

Student Tasks	Common Core Standards Applications
Vocabulary Development: For depth of understanding, vocabulary may be featured within the context of the unit instead of or in addition to the beginning of the lesson.	**RH.6–8.4:** Determine the meaning of words and phrases as they are used in a text, including vocabulary specific to domains related to history/social studies. **RI.6.4:** Determine the meaning of words and phrases as they are used in a text…
Steps 1 and 2: Using the ***California Connections: As Good as Gold*** (Student Edition, 2–5) resource, have students identify 3 resources discussed in the story and review vocabulary terms.	**RI.6.4:** Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings…
Step 3: After explaining the **Resources: Input, Supply, and Output** (Visual Aid #14) diagram, tell students they will use those ideas to categorize the natural resources found in ***California Connections: As Good as Gold***.	**RI.6.7:** Integrate information presented in different media or formats (e.g., visually, quantitatively) as well as in words to develop a coherent understanding of a topic or issue. **SL.6.2:** Interpret information presented in diverse media and formats (e.g., visually, quantitatively, orally) and explain how it contributes to a topic, text, or issue under study.
Steps 4–7: Conduct a class discussion surrounding renewable, nonrenewable, or inexhaustible resources by using **Petroleum: What Type of Resource?** (Visual Aid #15), **Fish: What Type of Resource?** (Visual Aid #16), **Sun: What Type of Resource?** (Visual Aid #17), and **Reclaimed Water** (Visual Aid #18).	**L.6.1:** Demonstrate command of the conventions of standard English grammar and usage when writing or speaking. **L.6.3:** Use knowledge of language and its conventions when writing, speaking, reading, or listening. **RI.6.7:** Integrate information presented in different media or formats (e.g., visually, quantitatively) as well as in words to develop a coherent understanding of a topic or issue. **SL.6.1:** Engage effectively in a range of collaborative discussions…

Student Tasks	Common Core Standards Applications
Steps 4–7 (Continued):	**SL.6.2:** Interpret information presented in diverse media and formats (e.g., visually, quantitatively, orally) and explain how it contributes to a topic, text, or issue under study.
Step 8: Students complete **Categorizing Resources** (Student Workbook, pages 9–10) for homework.	**W.6.4:** Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience… **W.6.9:** Draw evidence from literary or informational texts to support analysis, reflection, and research.

Unit Assessment

Refer to the introduction pages at the front of this document for information regarding the Traditional and Alternative Assessments for this unit and their Common Core correlations.

Reading *California Connections* using a Common Core Reading and Writing Focus

Reading

Science teachers can further enhance the teaching of Common Core Reading Literacy Standards by noting the suggestions below and in the following pages while reading the ***California Connections*** selection for content. Explicitly teach students to pay attention to the structure of the text by noting the following:

- Note how the author cites evidence to support main points and analysis. **(RST.6–8.1)**
- Note how the author sets up the central ideas or conclusions; provide an accurate summary of the text distinct from prior knowledge or opinions. **(RST.6–8.2)**
- Analyze how the author describes a scientific process or a multi-step procedure. **(RST.6–8.3)**
- Note how the author explains the meaning of key terms, symbols, domain specific words, and phrases. **(RST.6–8.4)**
- Analyze the structure the author uses to organize the text, including how the major sections contribute to the whole and to an understanding of the topic. **(RST.6–8.5)**
- Analyze the author's purpose in providing an explanation or describing a procedure. **(RST.6–8.6)**
- Note how the information in the California Connections text integrates with information provided visually throughout the unit in diverse formats, including tables, charts, graphs, diagrams, maps, and quantitative data. **(RST.6–8.7)**
- Distinguish among facts, reasoned judgment based on research findings, and speculation in a text, noting the reasoning and evidence used to support the author's claim. **(RST.6–8.8)**
- When other documents or media sources are included, compare and contrast the information presented in the various formats and resources with that from the text, noting how the information contributes to a coherent understanding. **(RST.6–8.9)**
- Note comprehension strategies for understanding the text. **(RST.6–8.10)**

Note: *Standard descriptions from the Reading Standards for Literacy in Science and Technical Subjects are paraphrased and combined, using terminology that applies to reading a* ***California Connections*** *selection.*

Writing

Many ***California Connections*** selections can be used as a model for future student writing tasks applying the Writing Literacy Standards by noting how the author structures the text, organizes the ideas, and provides well-chosen relevant and sufficient facts, extended definitions, concrete details, quotations, or other information and examples.

Using the *California Connections* Selection

The following pages note specific places where the ***California Connections*** selection provides examples for specific Writing Literacy Standards for Science and Technical Subjects, using this selection as a writing model. They also provide suggestions for teaching students to analyze text structure using the Reading Literacy Standards for Science and Technical subjects. Teachers can incorporate more suggestions from the list above. In addition, for teachers of self-contained classrooms, ELA standards are included.

RST.6–8.7: Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually…

As Good As Gold

California is rich in natural beauty and natural resources. Our state's natural resources feed us and provide our fuel. They are the focus of our jobs and a basic part of our daily lives, but not just our lives. Our state's resources are in high demand across the nation and around the world.

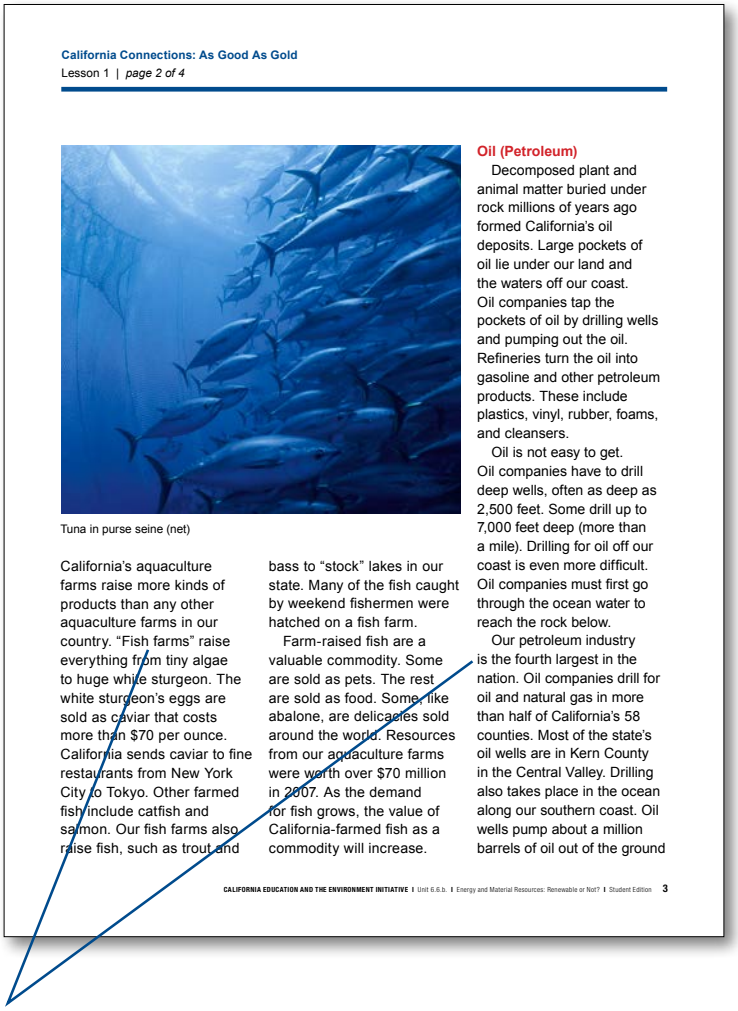
Our resources are commodities. That means that businesses buy and trade our resources on the world market with other countries, businesses, and people. The money earned helps our state's economy. It may seem strange that our land, trees, and animals have a dollar value, but they do. Some of our state's most valuable natural resources are fish, oil, and the Sun.

Fish

California is famous for its agriculture, but our fishing industry also has a long and important history. The ocean, streams, and rivers have always provided the people of California with fish. As more people settled in our state, they caught more fish. This changed the supply of fish. Sardines—once easy to find in California's ocean waters—almost disappeared by the late 1800s. Instead of sardines, fishing companies began to catch tuna. They caught so many tuna that after the 1950s, the number of tuna began to decline, too. Many fish companies realized their businesses would disappear if the fish disappeared. They had to change what they were doing, or they would have to catch other fish.

One option was aquaculture. Aquaculture is the practice of raising plants, fish, and shellfish in the ocean or in natural or human-made ponds, lakes, and rivers. Aquaculture began in the 1850s with oyster farms. Today,

School of sardines



California Connections: As Good As Gold
Lesson 1 | *page 2 of 4*

Tuna in purse seine (net)

California's aquaculture farms raise more kinds of products than any other aquaculture farms in our country. "Fish farms" raise everything from tiny algae to huge white sturgeon. The white sturgeon's eggs are sold as caviar that costs more than $70 per ounce. California sends caviar to fine restaurants from New York City to Tokyo. Other farmed fish include catfish and salmon. Our fish farms also raise fish, such as trout and bass to "stock" lakes in our state. Many of the fish caught by weekend fishermen were hatched on a fish farm.

Farm-raised fish are a valuable commodity. Some are sold as pets. The rest are sold as food. Some, like abalone, are delicacies sold around the world. Resources from our aquaculture farms were worth over $70 million in 2007. As the demand for fish grows, the value of California-farmed fish as a commodity will increase.

Oil (Petroleum)

Decomposed plant and animal matter buried under rock millions of years ago formed California's oil deposits. Large pockets of oil lie under our land and the waters off our coast. Oil companies tap the pockets of oil by drilling wells and pumping out the oil. Refineries turn the oil into gasoline and other petroleum products. These include plastics, vinyl, rubber, foams, and cleansers.

Oil is not easy to get. Oil companies have to drill deep wells, often as deep as 2,500 feet. Some drill up to 7,000 feet deep (more than a mile). Drilling for oil off our coast is even more difficult. Oil companies must first go through the ocean water to reach the rock below.

Our petroleum industry is the fourth largest in the nation. Oil companies drill for oil and natural gas in more than half of California's 58 counties. Most of the state's oil wells are in Kern County in the Central Valley. Drilling also takes place in the ocean along our southern coast. Oil wells pump about a million barrels of oil out of the ground

CALIFORNIA EDUCATION AND THE ENVIRONMENT INITIATIVE | Unit 6.6.b. | Energy and Material Resources: Renewable or Not? | Student Edition 3

RST.6–8.1: Cite specific textual evidence to support analysis of science and technical texts.

RST.6–8.2: Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.

RST.6–8.4: Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context…

RST.6–8.2: Determine the central ideas or conclusions of a text; provide an accurate summary of the text…

RST.6–8.7: Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually…

California Connections: As Good As Gold
Lesson 1 | *page 3 of 4*

every day. Most of this oil comes from our wells on the land.

California's supply of oil will someday run out. Because the supply is limited, oil is a valuable commodity. The oil still in the ground in California is worth about 26 billion dollars. As time goes on, and more people drive cars, we will need more oil to make gasoline and other products. Because the oil supply is limited, reusing motor oil and other petroleum-based products is also important. California companies recycle used motor oil, cleaning it up so it works like new. Chemists at these companies have also found ways to make oil-based products out of different materials. One example is synthetic motor oil. One day, we may need less "new" oil from our ocean and land.

Sun

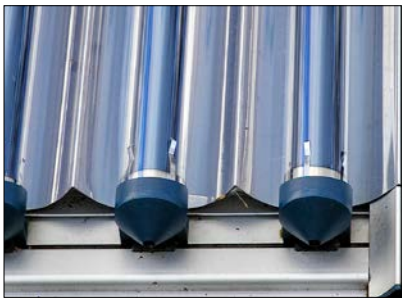
Surfers and beachgoers love California's sunshine, but its value goes far beyond a good day at the beach. California is one of the nation's sunniest states. Our sunshine attracts visitors and helps our farms grow crops all year. It can also provide us with a source of energy.

In the late 1800s, Californians began using the Sun's energy to heat water. By 1897, thousands of people in Pasadena had built some of the first solar water heaters. Flat boxes on their roofs contained rows of small pipes. These pipes were painted black to absorb as much heat as possible from the Sun. Hand pumps moved water up and into the pipes. As heated water was needed, a large pipe brought it back down to a faucet.

After oil was discovered in California in the 1920s, machines that ran on gasoline became popular. Many homes and businesses began burning natural gas or oil to heat water. For about 50 years, oil and natural gas provided almost all heating and transportation in the state. Oil was also used to

Oil derrick

4 CALIFORNIA EDUCATION AND THE ENVIRONMENT INITIATIVE | Unit 6.6.b. | Energy and Material Resources: Renewable or Not? | Student Edition



Solar water heater

make most of the electricity we needed. When oil prices began to rise in the 1970s, some people again started using the Sun's energy to heat water and their homes.

Today, we capture the Sun's energy in ways that are similar to those used in the late 1800s. Instead of black pipes, we use materials such as silicon. When sunlight hits the silicon (semiconductor material) in a "photovoltaic" cell (a power cell that can collect light energy) some of the light energy is absorbed. This energy can be captured in a way that allows us to produce electricity. California has several manufacturers of solar panels that are sold throughout the U.S. California companies were the first to use solar power to run their businesses. Now many homes in the state also run on solar power. In addition, more than a million homes produce hot water using the Sun's energy.

As our population grows, our use of natural resources also grows. Over millions of years, California's climate and geology created some of the state's most valuable natural resources. Some of these resources are depleted by how much of them we use. Other resources are not. For example, the Sun is an inexhaustible resource. It will not run out for a very long time. Many kinds of fish can be considered renewable resources, thanks to responsible fish farming. A resource like oil is nonrenewable. Oil cannot be replaced as quickly as we use it. Some day, it will run out.

California's industries have changed the way they do things because of changes to our natural resources. Aquaculture farms work to make sure that the products they provide and the ways in which they get resources do not cause problems in the future. Other California industries are finding ways to make resources renewable. Many are finding ways to make our nonrenewable resources last longer. All this creativity is good for the economy, and for the environment.

Solar panels

RST.6–8.2: Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.

RST.6–8.5: Analyze the structure an author uses to organize a text, including how the major sections contribute to the whole and to an understanding of the topic.

California Common Core State Standards Descriptions

Language Standards

- **L.6.1:** Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
- **L.6.2:** Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.
- **L.6.3:** Use knowledge of language and its conventions when writing, speaking, reading, or listening.
- **L.6.4:** Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on *grade 6 reading and content*, choosing flexibly from a range of strategies.
  - c) Consult reference materials (e.g., dictionaries, glossaries, thesauruses), both print and digital, to find the pronunciation of a word or determine or clarify its precise meaning or its part of speech.

Reading Standards for Informational Text

- **RI.6.1:** Cite textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.
- **RI.6.2:** Determine a central idea of a text and how it is conveyed through particular details; provide a summary of the text distinct from personal opinions or judgments.
- **RI.6.4:** Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings. **(See grade 6 Language standards 4–6 for additional expectations.) CA**
- **RI.6.7:** Integrate information presented in different media or formats (e.g., visually, quantitatively) as well as in words to develop a coherent understanding of a topic or issue.

Speaking and Listening Standards

- **SL.6.1:** Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grade 6 topics, texts, and issues*, building on others' ideas and expressing their own clearly.
- **SL.6.2:** Interpret information presented in diverse media and formats (e.g., visually, quantitatively, orally) and explain how it contributes to a topic, text, or issue under study.
- **SL.6.3:** Delineate a speaker's argument and specific claims, distinguishing claims that are supported by reasons and evidence from claims that are not.
- **SL.6.4:** Present claims and findings **(e.g., argument, narrative, informative, response to literature presentations)**, sequencing ideas logically and using pertinent descriptions, facts, and details **and nonverbal elements** to accentuate main ideas or themes; use appropriate eye contact, adequate volume, and clear pronunciation. **CA**
- **SL.6.5:** Include multimedia components (e.g., graphics, images, music, sound) and visual displays in presentations to clarify information.
- **SL.6.6:** Adapt speech to a variety of contexts and tasks, demonstrating command of formal English when indicated or appropriate. (See grade 6 Language standards 1 and 3 for specific expectations.)

Writing Standards

- **W.6.1:** Write arguments to support claims with clear reasons and relevant evidence.
- **W.6.2:** Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.
- **W.6.4:** Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. (Grade-specific expectations for writing types are defined in standards 1–3 above.)
- **W.6.9:** Draw evidence from literary or informational texts to support analysis, reflection, and research.

Reading Standards for Literacy in History/Social Studies

- **RH.6–8.4:** Determine the meaning of words and phrases as they are used in a text, including vocabulary specific to domains related to history/social studies.
- **RH.6–8.7:** Integrate visual information (e.g., in charts, graphs, photographs, videos, or maps) with other information in print and digital texts.

Reading Standards for Literacy in Science and Technology Subjects

- **RST.6–8.1:** Cite specific textual evidence to support analysis of science and technical texts.
- **RST.6–8.2:** Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.
- **RST.6–8.4:** Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 6–8 texts and topics*.
- **RST.6–8.5:** Analyze the structure an author uses to organize a text, including how the major sections contribute to the whole and to an understanding of the topic.
- **RST.6–8.7:** Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).
- **RST.6–8.8:** Distinguish among facts, reasoned judgment based on research findings, and speculation in a text.