

Lesson 4



Nimbus Dam, Folsom, California

Changes in Our Local Region

This lesson introduces students to the types of changes people make in natural systems and to the ways in which those changes affect people and other living things differently. Students briefly revisit the maps they have used in the previous lessons to look for evidence of change in their local region.

By comparing information collected from the maps, students realize the extent to which people's activities have affected natural systems in California. They then explore the consequences of such changes. Working in groups, students

read scenarios that present possible changes in each of the four-land use categories they learned about in Lesson 3: agriculture, construction, recreation, and transportation. They consider the effects of each proposed change by identifying ways in which

the activity might affect people and other living things within their local region. Students use this information to complete a chart and individual concept maps they have developed throughout the unit.

Learning Objectives

Identify the ways humans have changed the natural systems (physical and living environment) in their local region to extract, harvest, transport, and consume natural resources (goods and ecosystem services).

Provide examples of how the extraction, harvesting, transportation, and consumption of natural resources have influenced the natural systems in the local region.



however, has caused soil compaction and promoted erosion. Irrigation has caused the accumulation of salts in the soil and in runoff water, rendering some resources unusable. Runoff has carried pesticides and toxic minerals into waterways and has polluted bodies of water, such as San Francisco Bay and the Colorado River. In the 1980s, selenium poisoning caused a massive die-off of migratory waterfowl in the former Kesterson National Wildlife Refuge.

The consequences of modifying natural systems are complex. Some are detrimental, while others are beneficial. Modifications have different effects on different populations and sometimes depend on perspective.

Carefully considered land-use practices that take geographic and natural features into account can reduce negative effects of land development. Such practices include habitat restoration projects and environmental mitigation. Habitat restoration efforts aim to restore a given habitat to a pre-disturbance state. Environmental mitigation includes steps to avoid and minimize damage to sensitive areas during development and to offset unavoidable losses with restoration or enhancement efforts elsewhere.

Background

People have a tremendous capacity to change their physical environment to better suit their needs. From small modifications, such as planting a backyard garden, to huge undertakings, such as building new housing developments, people change their surroundings to make their lives safer, better, easier, more profitable, or more enjoyable. Changes to natural systems, however, are not without costs.

Different people react to environmental changes in different ways. Some people view the construction of a dam as a rich opportunity to meet water demands,

better manage water supplies, generate power, and provide still-water recreation. To other people, however, the same dam means the loss of white-water rafting and a rising concern for loss of species and habitats.

Ecologically, the construction of a dam reduces river and riparian habitats, creates challenges for migrating fish, and permanently floods surrounding countryside. It also creates new habitat for lake species.

California feeds the state, the nation, and the world. Converting California's arid lands to pasture and farmlands has brought economic benefit along with readily available food supplies. Overgrazing,



Whitewater rafting

Key Vocabulary

Change: (noun) The result of making something different.
(verb) Making something different.

Effect: The outcome or result of an action.

Toolbox



Summary of Activities

Students revisit the wall maps to look for evidence of change in California due to human activity. They read about changes related to agriculture, construction, recreation, and transportation and consider how such changes might affect people and other living things in their local region.



Instructional Support

See Extensions & Unit Resources, pages 24–25.

Prerequisite Knowledge



Students should know:

- how the landforms and natural features of their local region can influence human activities, such as agriculture, construction, transportation, and recreation.
- the basic needs of living things.

Advanced Preparation



Gather and prepare Materials Needed:

- Gather from previous lessons:
 - **Our Local Region Chart** from Lesson 3 and post on wall

Gather and prepare A-V Materials:

- Wall Maps:
 - Post the **People and the Environment, Natural Regions, and Political** wall maps side-by-side, with all three **Local Region Rings** attached, in a location visible to all students.

Add new vocabulary to Word Wall

Prepare Answers:

- Use the wall maps to prepare answers for the “How We Change Our Local Region” part of **My Local Region** (Student Workbook).



Materials Needed



Class Supplies:

- colored markers
- pencils
- tape or thumbtacks

Student Workbook:

- **My Local Region**, pages 2–3
- **Making Changes—Agriculture**, pages 4–5
- **Making Changes—Construction**, pages 6–7
- **Making Changes—Recreation**, pages 8–9
- **Making Changes—Transportation**, pages 10–11

Audio-Visual Materials



No additional Audio-Visual Materials are required for this lesson.

Duration



Preparation Time

30 min.

Instructional Time

45 min.



Safety Notes

None

Procedures

Vocabulary Development

Use the **Dictionary Workbook** and the vocabulary **Word Wall Cards** to introduce new words to students as appropriate.

Step 1

Ask students to gather in front of the three wall maps (**People and the Environment**, **Political**, and **Natural Regions**). Briefly review the geographical features, the natural regions, and the land-use practices inside the **Local Region Rings** on each wall map.

Call students' attention to the **Natural Regions** wall map. Point out the illustrations of native plants and animals that are native to each region. Ask students, "Is this how the area looks now? Do you usually see the plants and animals described?" (*Answers will vary depending on where students live, but the expected answer in most areas will be, "No."*)

Explain that this map shows what some of the natural parts of each area include. Tell students that human activities over hundreds of years have changed California's natural systems.

Step 2

Focus students' attention on the **Political** wall map. Review the key features legend, and ask which symbols indicate changes made by people. (*All except those listed under physical features.*) Ask students to name examples of change they see in their own community. (*Pavement, buildings, roads, cars, railroad tracks, parking lots*)

Have students examine the **People and the Environment** wall map, and their local region in particular. Ask them to think of examples of change due to human activities in their community, like agriculture, construction, recreation, and transportation. (*Cars, farms, neighborhoods, cities, airports, dams, railroad tracks, roads*) Ask students why people made these types of changes in their local region. (*To get food, to have a house, to get from one place to another, to have fun.*)

Step 3

Explain to students that they will be working with others in a group to read about a possible change to their local region and that they will have to think about the effects that the changes could have on people and other living things in their local region.

Divide the class into four groups and have the students in each group sit together. Assign each group one of the four categories of land use that students identified in Lesson 3: Agriculture, Construction, Recreation, or Transportation.

Redistribute students' individual **Student Workbooks**. Based on the land use assigned to each group, tell the students to turn to **Making Changes—Agriculture**, **Making Changes—Construction**, **Making Changes—Recreation**, or **Making Changes—Transportation** (Student Workbook, pages 4–10). Choose one student in each group to read aloud the scenario at the top of the page while the other students in the group follow along. Tell students that when they have finished reading, they should read and discuss the questions at the bottom of the page. Give the groups 10 minutes to complete the reading and the discussion of the questions.

Step 4

When time is up, call on a student from each group to read to the whole class the scenario their group discussed. After students finish reading, ask them to share how their group thought the change could affect the local region. List students' ideas in the fourth column on the **Our Local Region Chart**.

After all groups have completed their presentations, ask students:

- Have any of these, or similar, changes been made in our local region? (*Yes*)
- Did the changes affect people and other living things in the same way? (*No*)
- Why do people make changes to natural systems? (*To make things safer, better, easier, or more enjoyable for themselves.*)



Point out that changes to the local region affect people and other living things differently and that some changes that help people may harm other living things.

Step 5

Tell students to turn to **My Local Region** (Student Workbook, pages 2–3). Ask them to complete the final part of the **My Local Region** concept map, “How We Change Our Local Region,” by listing changes people have made to natural systems in their local region. Remind students to use the information on the wall maps and on the **Our Local Region Chart** to help them.

Collect **Student Workbooks** and use **My Local Region** for assessment. Keep the **Student Workbooks** for use in the alternative unit assessment.

Lesson Assessment

Description

My Local Region (Student Workbook, pages 2–3) assesses students' achievement of the learning objectives: "Provide examples of how the extraction, harvesting, transportation, and consumption of natural resources have influenced the natural systems in the local region" and "Identify the ways humans have changed the natural systems (physical and living environment) in their local region to extract, harvest, transport, and consume natural resources (goods and ecosystem services)." To demonstrate what they have learned, students complete one section of a concept map.

Suggested Scoring

A general example of Sample Answers for all six parts of **My Local Region** are provided on pages 33–34. Use the region-specific answers you created for the "How We Change Our Local Region" part of **My Local Region** to assess the completeness and accuracy of students' responses. There are 5 total possible points for the part completed during this lesson.

Answer Key and Sample Answers

Making Changes—Agriculture

Lesson 4 | page 1 of 2

Name: _____

Instructions: Read the story with your group. Then read each question and talk about the answers with your group.

The Jones Family

The Jones family wants to start a new farm in your local region. The family plans to cut down some trees to clear a place for crops and plow the soil. They will use fertilizers to help the plants grow. They will also use chemicals to keep pests from eating the crops. If all goes well, they will sell their food at the farmers' market near your house. You will be able to buy fresh vegetables.

Questions:

1. What is one way that the Jones' farm might help people in our region?

Food will be available.

The family will be able to work and earn money.

2. What is one way that the Jones' farm might harm people in our region?

The chemicals might harm people or animals.

It could run off the land and get into water.

Answer Key and Sample Answers

Making Changes—Agriculture

Lesson 4 | page 2 of 2

Name: _____

3. What is one way that the Jones' farm might help other living things in our region?

Some animals might feed on the seeds or the crops.

4. What is one way that the Jones' farm might harm other living things in our region?

Some plants and animals will lose their homes when the land is cleared.



Answer Key and Sample Answers

Making Changes—Construction

Lesson 4 | page 1 of 2

Name: _____

Instructions: Read the story with your group. Then read each question and talk about the answers with your group.

The Hart Company

The Hart construction company wants to build new homes in your local region. The company plans to cut down some trees to clear a space for the houses and for roads to get to the houses from other places. Machines will be used to make the land flat. The company will build small homes that do not cost a lot. Many people will buy the homes and live in the new community. They will need a school and stores, too.

Questions:

1. What is one way that the new community might help people in our region?

People will be able to buy new homes they can afford.

Builders will have more jobs.

2. What is one way that the new community might harm people in our region?

The area will be more crowded.

There will be more cars, more noise, and more pollution.

Answer Key and Sample Answers

Making Changes—Construction

Lesson 4 | page 2 of 2

Name: _____

3. What is one way that the new community might help other living things in our region?

Some animals might find homes or food in the new community.

4. What is one way that the new community might harm other living things in our region?

Some plants and animals will lose their homes when the land is cleared.



Answer Key and Sample Answers

Making Changes—Recreation

Lesson 4 | page 1 of 2

Name: _____

Instructions: Read the story with your group. Then read each question and talk about the answers with your group.

The Water Company

The government of our local region knows that we need to store water for times when there is not much rain. Our leaders have decided to build a dam on a river in our local region. The Water Company that controls our water will make the plans for the dam and hire people to build it. The dam will stop some water from flowing in the river. Water behind the dam will flood the land and create a lake. People will be able to boat and swim in the lake.

Questions:

1. What is one way that the building of the dam might help people in our region?

The lake will be a fun place to boat and swim.

There will be water in times when there is not much rain.

2. What is one way that the building of the dam might harm people in our region?

With the water flow reduced in the river downstream from the dam, nearby people might not have enough water.

Answer Key and Sample Answers

Making Changes—Recreation

Lesson 4 | page 2 of 2

Name: _____

3. What is one way that the building of the dam might help the other living things in our region?

Fish will be able to live in the lake.

4. What is one way that the building of the dam might harm the other living things in our region?

Plants and animals that live near the river might lose their habitat when it is flooded by the dam.



Answer Key and Sample Answers

Making Changes—Transportation

Lesson 4 | page 1 of 2

Name: _____

Instructions: Read the story with your group. Then read each question and talk about the answers with your group.

The Bike Club

There is a lot of traffic on some of the roads in your local region. Some people want to make the roads wider. The people in the Bike Club want the government to build a bike path instead. People could use the path to bike to work and school. To build the bike path, trees will be cleared from a strip of land along the river. The path will be paved so that it is easy and safe for biking. The leaders hope that if people can bike safely and easily, there will be fewer cars on the road.

Questions:

1. What is one way that building the bike path might help people in our region?

Fewer people may get stuck in traffic if more of them use the bike path.

There would be less pollution from cars and buses.

2. What is one way that building the bike path might harm people in our region?

It will take longer to get to school or work.

People might miss the trees.

Answer Key and Sample Answers

Making Changes—Transportation

Lesson 4 | page 2 of 2

Name: _____

3. What is one way that building the bike path might help other living things in our region?

The bike path will take less space than making the road wider.

4. What is one way that building the bike path might harm other living things in our region?

Plants and animals that live near the river might lose their homes.

Animals that lived or nested in the trees will lose that habitat too.



Name: _____

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Questions:

1. What is one way that the Jones’ farm might help people in our region?

2. What is one way that the Jones’ farm might harm people in our region?

Name: _____

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4. What is one way that the Jones' farm might harm other living things in our region?



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Questions:

1. What is one way that the new community might help people in our region?

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Questions:

1. What is one way that the building of the dam might help people in our region?

2. What is one way that the building of the dam might harm people in our region?

Name: _____

3. What is one way that the building of the dam might help the other living things in our region?

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Questions:

1. What is one way that building the bike path might help people in our region?

2. What is one way that building the bike path might harm people in our region?

Making Changes—Transportation

Lesson 4 | page 2 of 2

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