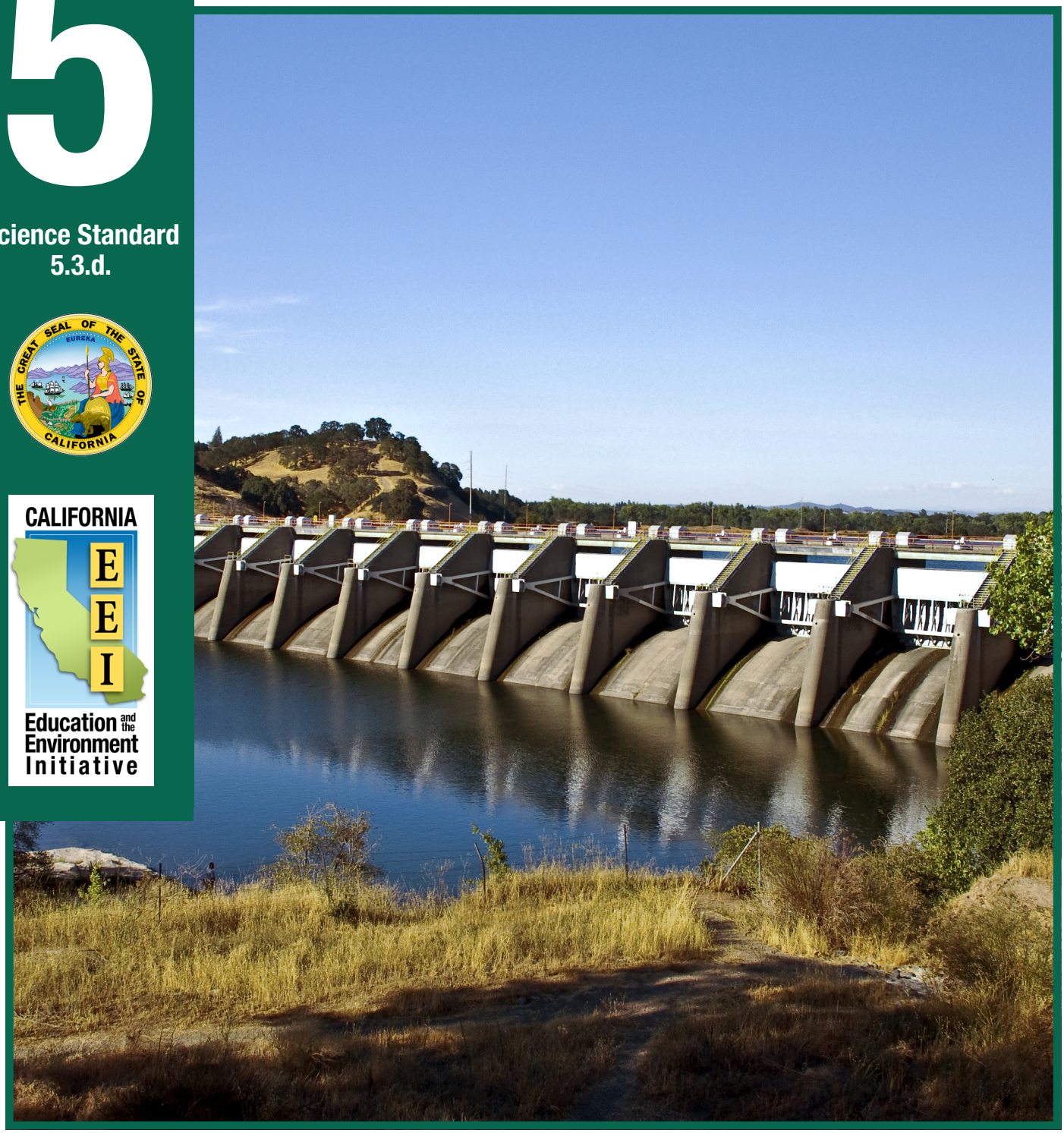
5

Science Standard
5.3.d.

Teacher's Masters

California Education and the Environment Initiative



Our Water: Sources and Uses

California Education and the Environment Initiative

Approved by the California State Board of Education, 2010

The Education and the Environment Curriculum is a cooperative endeavor of the following entities:

California Environmental Protection Agency
California Natural Resources Agency
Office of the Secretary of Education
California State Board of Education
California Department of Education
California Integrated Waste Management Board

Key Leadership for the Education and Environment Initiative:

Linda Adams, Secretary, California Environmental Protection Agency
Patty Zwarts, Deputy Secretary for Policy and Legislation, California Environmental Protection Agency
Andrea Lewis, Assistant Secretary for Education and Quality Programs, California Environmental Protection Agency
Mark Leary, Executive Director, California Integrated Waste Management Board
Mindy Fox, Director, Office of Education and the Environment, California Integrated Waste Management Board

Key Partners:

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Contents

Lesson 1 Reservoirs Revealed

None required for this lesson.

Lesson 2 Water Consumption Considered

None required for this lesson.

Lesson 3 Working with Wastewater

None required for this lesson.

Lesson 4 What Would You Do with the Water?

None required for this lesson.

Lesson 5 What a Difference Water Makes

Watershed Scenarios 2

Assessments

Water Sources and Uses—
Traditional Unit Assessment Master 5

Publicity Brochure Instructions—Alternative Unit Assessment Master 13

Sacramento River Scenario

Rainfall is very heavy this year. As a result, the Sacramento and American rivers flood. The water runs over the banks. The farmlands in the region flood. People's homes are also flooded.

Colorado River Scenario

The water from the Colorado River travels a long way. It is used by Arizona, California, Colorado, Nevada, New Mexico, Utah, and Wyoming, and by ecosystems and people in Mexico. After several years of drought, the Colorado River is very low. The Colorado River watershed is not getting the amount of water it normally receives.

San Francisco Bay Scenario

The people of San Francisco develop a way to make fresh water out of salt water. They are using solar power. They now get their water from San Pablo and San Francisco bays. They no longer need the water from the aqueducts that enter their watershed.

San Joaquin River Scenario

Because conditions were good for insects this past year, there were more insects than normal. Farmers sprayed more pesticides in summer to keep the insects from destroying their crops. Now, in the late summer, there was a surprise heavy rainfall. Usually much of the pesticide used during the summer decomposes before winter rains when the runoff flows into rivers, lakes, and reservoirs. Pesticides that are allowed to be used in agriculture decompose more readily in the environment after application. Therefore, these pesticides are less likely to remain on crop residue or soil by the time winter comes, after a summer application.

South Coast Scenario

People who live in the mountains of the South Coast watershed wanted more recreation areas. They decided to dam all the local rivers to create reservoirs for boating and fishing. The existing reservoirs in the watershed dried out. No water is flowing into them anymore. The people in the flatter areas of the South Coast watershed no longer get water from the snowmelt because the people in the mountains have dammed the rivers.

North Coast Scenario

During a very heavy rainstorm, cracks appear in Trinity Dam. Suddenly, the dam breaks. A huge amount of water rushes into the Trinity River and overflows the banks. It floods the area. It spills into places that have never flooded before.

Name: _____

Part 1

Instructions: Complete each sentence below with the best word from the Word Bank. (1 point each)

Word Bank

precipitation	conserving	reservoirs
aquifer	potable	watershed

1. One place water collects in the water cycle is natural _____.
2. An _____ is an underground layer of rock or sediment that holds usable amounts of groundwater.
3. If I take shorter showers and sweep my driveway instead of hosing it down with water, I am _____ water.
4. _____ is the part of the water cycle that brings fresh water down to Earth from the atmosphere.
5. Water that is safe for drinking, according to public health standards, is called _____.
6. If pesticides run off into water, there may be consequences for the ecosystems and human communities within the entire _____.

Name: _____

Part 2

Instructions: Select the best answer (or answers) for each question by circling the correct letter (or letters). There may be more than one answer. (3 points each question)

7. Which of the following could make survival on hiking trips easier?
   - a. ocean
   - b. rivers and streams
   - c. glaciers
   - d. snowpack
   - e. groundwater (from an artesian spring)
   - f. lakes
   - g. ice at the Poles

8. Which of the following has limited fresh water available?
   - a. lakes
   - b. rivers
   - c. waterfalls
   - d. glaciers

9. Which steps of the water cycle naturally help to clean water?
   - a. precipitation
   - b. accumulation
   - c. percolation/infiltration
   - d. transportation
   - e. evaporation
   - f. condensation

10. Which of the following is true about wastewater treatment?
    - a. Wastewater treatment can make people sick.
    - b. Treated wastewater is never used on landscaping.
    - c. Wastewater is treated and sent to the ocean.
    - d. Wastewater is treated and added to the groundwater.

Name: _____

Part 3

Instructions: Read the questions below and write a short answer for each. (5 points each)

11. If so much of Earth is covered by water, why is fresh water a limited resource?

12. Describe two ways that water can travel, through the water cycle, from one reservoir to another.

Name: _____

13. Humans use water in a variety of ways. List two ways in which humans use water in these categories: personal, community, agricultural, and industrial. (1 point each)

Personal Uses

a. _____

b. _____

Community Uses

a. _____

b. _____

Agricultural Uses

a. _____

b. _____

Industrial Uses

a. _____

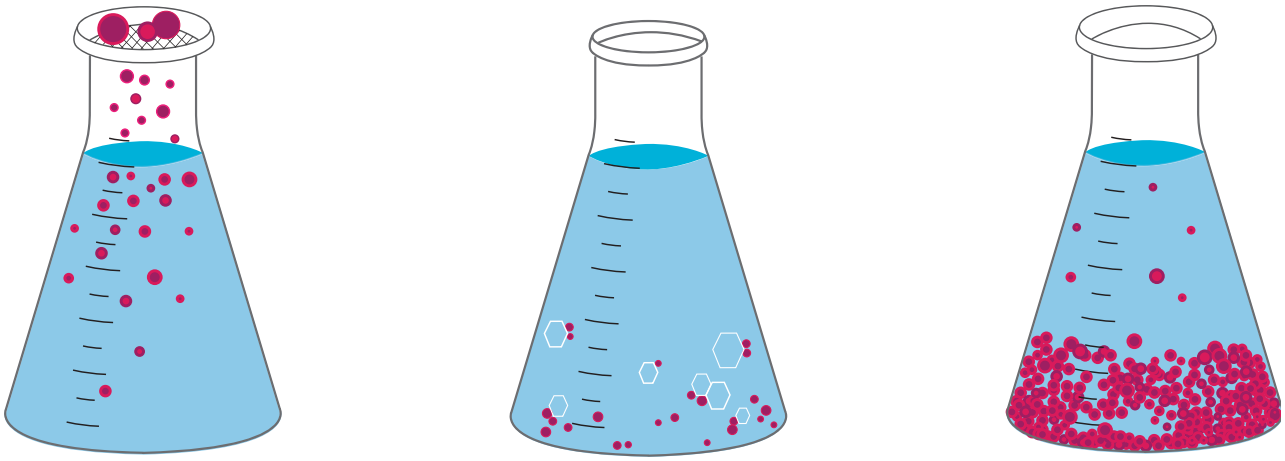
b. _____

14. List five ways in which people can conserve water. (1 point each, 5 points total)

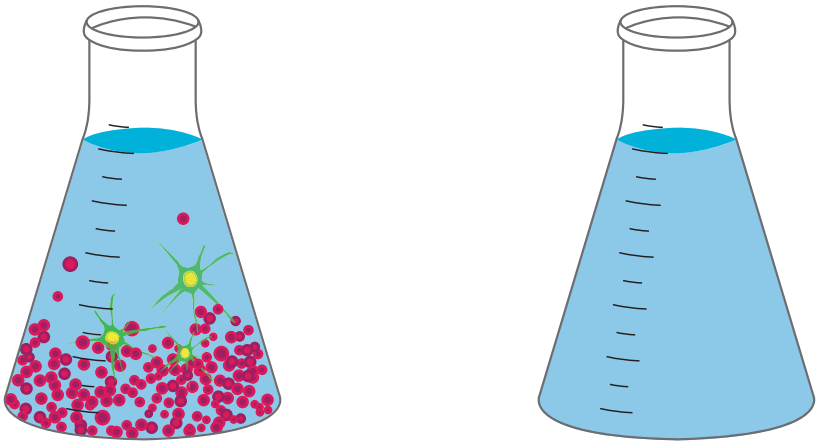
Name: _____

15. On page 7, describe what happens in these three methods used in wastewater treatment systems. Use the diagram below to help you.

Method 1: Primary Treatment

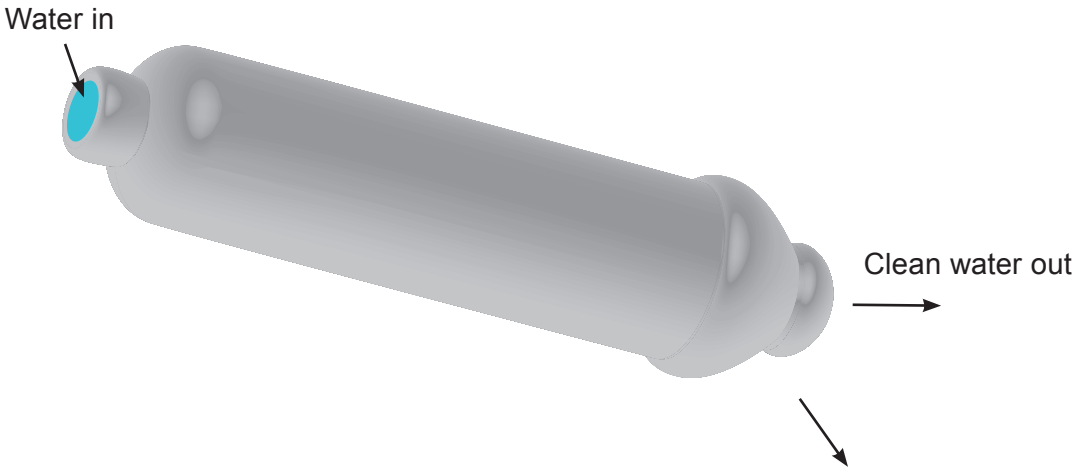


Method 2: Secondary Treatment



Name: _____

Method 3: Advanced Treatment



Method 1 (2 points)

Method 2 (2 points)

Method 3 (2 points)

16. Describe at least three ways in which changes to water in a watershed can influence ecosystems. (1 point each)

Name: _____

17. Describe at least three ways in which changes to water can influence the human community. (2 points each)

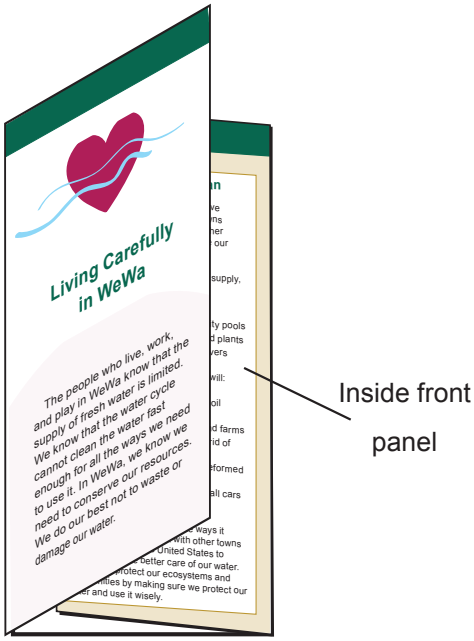
Name: _____

Instructions: Make a publicity brochure for a pretend town somewhere in California. Use words and pictures to describe how the town conserves water.

Your brochure must include everything on this list: (up to 4 points each based on the **Publicity Brochure Scoring Tool**)

- List three or more sources of the town's fresh water.
- Tell how people in the town use and conserve water. Give two examples for individuals. Give two examples for businesses and industries. Give two examples for the whole community. Describe primary, secondary, and advanced wastewater treatment.
- Explain, with details, why the town is so careful about its use of fresh water. (Why is fresh water a limited resource?)
- Describe at least three ways that the town's water use affects nearby ecosystems.
- Explain two things that could change your town's water supplies. Describe how your community could fix the problems.
- Be creative!

Use the **Publicity Brochure Scoring Tool** on the following page to guide your writing.



Folded Brochure

Your brochure is due on _____ .

Name: _____

Publicity Brochure Scoring Tool

Component	4 points	3 points	2 points	1 point
Identifies the town's freshwater sources.	Identifies three or more sources of usable fresh water.	Identifies two sources of usable fresh water.	Identifies one source of usable fresh water.	Inaccurately identifies sources of usable fresh water.
Identifies how people in the town use and conserve water.	Identifies six or more practices in the three categories (individual, industry, community).	Identifies four or five practices in the three categories (individual, industry community).	Identifies three or four practices in one or two categories (individual, industry, community).	Identifies one or two practices in one or two categories (individual, industry, community).
Describes wastewater treatment.	Accurately describes primary, secondary, and advanced wastewater treatment.	Accurately describes the treatments, but misses some details.	Accurately describes most of the processes but misses some important information when describing one of the treatment methods.	None–treatment methods are not described.
Explains why the town is so careful about its use of fresh water.	Accurately explains why fresh water is a limited resource and provides details.	Accurately explains why fresh water is a limited resource.	Does not fully explain why fresh water is a limited resource.	Does not fully explain why fresh water is a limited resource.
Describes how your town's use of water could affect nearby ecosystems.	Provides at least four accurate explanations of possible consequences on ecosystems.	Provides at least three accurate explanations of possible consequences on ecosystems.	Provides at least two accurate explanations of possible consequences on ecosystems.	Provides at least one accurate explanation of possible consequences on the ecosystems.
Explains how the water in your town could change and describe how your community would react.	Provides two possible changes to the town's water and identifies two reasonable solutions to fix the situation.	Provides two possible changes to the town's water and identifies one reasonable solutions to fix the situation.	Provides one possible change to the town's water and identifies one reasonable solution to fix the situation.	Provides either a possible change to the town's water situation.

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