



Lesson Walk-Through

Introduction

Environmental Science © 2011 offers opportunities for teaching environmental science that fully integrate text, inquiry, and digital resources. The program offers a variety of tools to assist teachers in planning for understanding, setting assessment goals, and teaching the concepts. MyEnvironmentalScience.com and the Classroom Resource DVD-ROM offer engaging digital content, assessments, and editable instructional and lab materials. This guide provides teachers with suggestions on using these materials to teach a typical lesson from the program.

Planning for Instruction and Assessment

Planning for assessment and instruction begins with MyEnvironmentalScience.com or the Classroom Resource DVD-ROM. The Lesson Plan section gives teachers guidance in planning instruction for chapters and lessons. Lesson plans include objectives, hyperlinks to lesson activities, materials lists, pacing suggestions, and teacher notes.

14.1	
Lesson 14.1 Earth: The Water Planet	
Objectives <ul style="list-style-type: none"> 14.1.1 Discuss how fresh water can be both renewable and limited. 14.1.2 Explain the significance of a watershed. 14.1.3 Explain how most groundwater is accessed. 	Lesson Links <ul style="list-style-type: none"> Graph It: Global Freshwater Resources Paper and Pencil Activity: Watershed Boundaries Map It: The Mississippi River Watershed Lesson 14.1 Worksheets Water Resources Lesson 1 Assessment Chapter 14 Overview Presentation (for PowerPoint): Water Resources

Lesson Plans are located in the Savvas Content area of MyEnvironmentalScience.com. To navigate to Lesson Plans, select the chapter, and then choose **Lesson Plans**. The options include plans for introducing the chapter with the Central Case and each lesson.



Central Case

The Central Case is used to highlight the Enduring Understanding and Big Question that students will need to know to for each chapter. The Enduring Understanding is the overall concept addressed in the chapter, and the Big Question is asked to provide a focus and purpose for learning as students address the Enduring Understanding that they must understand by the end of the chapter.

To learn more about the Enduring Understandings and Big Questions, please refer to the Applying Understanding by Design tutorial guide.

The screenshot shows a digital textbook page for 'Water Resources' (Chapter 14). It features a 'Central Case' section titled 'Looking for Water... in the DESERT'. The page includes a large image of a desert landscape with a river. Text on the page discusses the Colorado River Compact, water scarcity in Las Vegas, and the impact of population growth. A 'BIG QUESTION' is highlighted: 'Why are we running out of water?'. A map of the Colorado River basin is also visible.

Lesson Highlights

Each lesson is arranged so that there are plenty of opportunities to engage with content that connects to the Central Case and the Big Question.

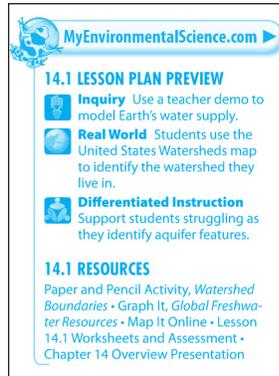
Lesson Objectives

Lessons begin by introducing Knowledge and Skills objectives, as well as Reading Strategy and Vocabulary.

The screenshot shows a digital textbook page for 'Earth: The Water Planet' (Lesson 1). It features a 'Guiding Question: Where is all of our water?'. The page is divided into two main sections: 'Knowledge and Skills' and 'Reading Strategy and Vocabulary'. The 'Knowledge and Skills' section lists objectives related to renewable water, watersheds, and groundwater. The 'Reading Strategy and Vocabulary' section provides instructions for reading and lists key terms.

Lesson Plan Preview

The Teacher’s Edition offers a preview of lesson inquiry activities, real-world connections, differentiated instruction, and resources. The Lesson Plan preview is always shown as blue text in the margin of the first page of each lesson.



MyEnvironmentalScience.com

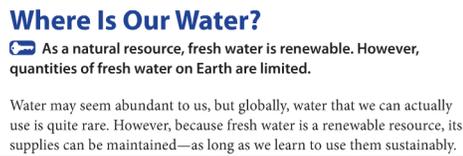
14.1 LESSON PLAN PREVIEW

- Inquiry** Use a teacher demo to model Earth’s water supply.
- Real World** Students use the United States Watersheds map to identify the watershed they live in.
- Differentiated Instruction** Support students struggling as they identify aquifer features.

14.1 RESOURCES
Paper and Pencil Activity, Watershed Boundaries • Graph It, Global Freshwater Resources • Map It Online • Lesson 14.1 Worksheets and Assessment • Chapter 14 Overview Presentation

Key Knowledge and Skills

As students read the chapter, they are reminded of the Knowledge and Skills objectives each time they encounter the key icon.



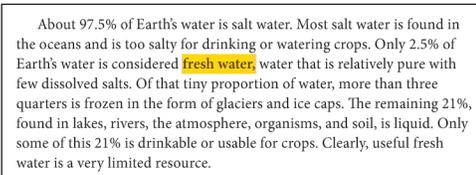
Where Is Our Water?

As a natural resource, fresh water is renewable. However, quantities of fresh water on Earth are limited.

Water may seem abundant to us, but globally, water that we can actually use is quite rare. However, because fresh water is a renewable resource, its supplies can be maintained—as long as we learn to use them sustainably.

Vocabulary

Highlights also notify students each time that a new lesson vocabulary word is introduced.



About 97.5% of Earth’s water is salt water. Most salt water is found in the oceans and is too salty for drinking or watering crops. Only 2.5% of Earth’s water is considered **fresh water**, water that is relatively pure with few dissolved salts. Of that tiny proportion of water, more than three quarters is frozen in the form of glaciers and ice caps. The remaining 21%, found in lakes, rivers, the atmosphere, organisms, and soil, is liquid. Only some of this 21% is drinkable or usable for crops. Clearly, useful fresh water is a very limited resource.

Inquiry Activities

Lesson inquiry activities are available on MyEnvironmentalScience.com and the Classroom Resource DVD-ROM. These editable activities include the Paper and Pencil Activity, the In Your Neighborhood Activity, and the Outdoor Lab.

The Lab Manual for the chapter is located in the Savvas Content area of MyEnvironmentalScience.com. To navigate to the Lab Manual, select the Lab Manual folder.



One inquiry activity for Chapter 14, Lesson 1 is the Paper and Pencil Activity: Watershed Boundaries. In this activity, students learn how watershed boundaries are defined.

Chapter 14 **Watershed Boundaries**

Problem *How do you define the boundaries of a watershed?*

Background

Why Watersheds?
 Not all of the water that flows out of the mouth of a river started at its source. Tributaries, surface runoff, and even some groundwater contribute to a river's flow. Along the way, this water can pick up pollutants and concentrate them in the river. Because of this, ecologists studying river systems often want to consider pollution sources from the entire watershed—the area of land that drains into a river system.

Water Runs Downhill
 To define watershed boundaries, scientists start with the fact that water always runs downhill. Consider a raindrop that falls on one side of a mountain. It will flow down the side it fell on, not run up and over the mountain's peak. Because of this, the boundaries of a watershed are formed by high points, like mountain peaks and ridges. A ridge is a narrow stretch of high land with a slope on either side. Ecologists identify watershed boundaries by reading topographical maps. Topographical maps show the elevation, or height above sea level, of landforms by

Chapter 14, Lesson 1 also features a teacher demonstration activity. The demonstration illustrates how much of the Earth's total amount of water is actually fresh water. The teacher pours different quantities of water into a two-liter plastic bottle to represent the different types of water. The instructions for the demonstration are included in the Lesson Plan.

Lesson Activities

The Lesson Plan also features Lesson Links to activities that teachers can use to teach and reinforce the lesson's objectives. These activities are accessible by clicking the hyperlinks on the Lesson Plan or by navigating directly to the lesson resources on MyEnvironmentalScience.com or the Classroom Resource DVD-ROM.



There are a variety of activities for Chapter 14, Lesson 1. The following describes a few.

Graph It: Global Freshwater Resources

In this online activity, students create a graph showing the total fresh water resources for each continent.

Global Fresh Water Resources Step 1: Total water resources

Continent	Total water
Europe	2.9
N. Amer.	8
Asia	4.1
Africa	13.5
S. Amer.	12
Australia	2.1

Total water in units of 1000 km³ per year

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Fresh water is not distributed evenly across the Earth's surface. Variation in precipitation—and in the distribution of rivers, lakes, and equifers—results in large differences in water availability between regions and continents.

The table at left shows the estimated availability of fresh water by continent. The values are 1000s of cubic kilometers per year. This represents the total volume of fresh water available to that continent each year.

Press Continue to proceed

Map It: The Mississippi River Watershed

This activity is available in the student edition or as an online activity. Students practice their map skills by interpreting, explaining, and inferring map data.



Study Workbook

The *Study Workbook* provides activities to introduce the Big Question, preview vocabulary, organize concepts, and reinforce math and reading skills. This program resource is available as a traditional printed workbook or as editable worksheets on MyEnvironmentalScience.com and the Classroom Resource DVD-ROM.

The Student Worksheets are located in the Savvas Content area of MyEnvironmentalScience.com. To navigate to the worksheets, select the chapter, and then choose the Student Worksheets.

Assessment

The assessment options ask students to connect what they have learned to the Big Question and the Central Case. Assessments occur during the lesson, after the lesson, and at the conclusion of the chapter.

During the lesson, students are asked to think about what they have learned and relate it to the Central Case. On page 423 in the student edition, the Connect to the Central Case asks, "What forms the eastern boundary of the Colorado Watershed?"

**Connect to the Central Case****FIGURE 10 Costs and Benefits of**

Dams Damming rivers has diverse consequences for people and the environment. The Glen Canyon Dam on the Colorado River is no exception.

Infer How do you know that the river is flowing from left to right in this photo?

The Assessment section at the end of each lesson asks students to complete items related to the lesson's objectives.

LESSON 3 Assessment

1. **Compare and Contrast** What is the difference between point and nonpoint sources of water pollution? Give an example of each.
2. **Explain** Why is groundwater pollution so hard to clean up?
3. **Relate Cause and Effect** Explain how using nitrogen-rich fertilizers can affect algal blooms in the oceans.
4. **Sequence** Describe the steps involved in a typical public drinking water treatment process.

5. **THINK IT THROUGH** You run a large farm that is considering using sludge from wastewater treatment plants as fertilizer. You have been told that the sludge can increase the growth rate of your crops, and you know that using the sludge will prevent it from making its way into landfills. However, you have also heard that sludge can contain pollutants such as heavy metals and pathogens. What questions would you want to ask before deciding to use the sludge? Do you feel that the benefits outweigh the costs?

Finally, on page 447 in the student edition, students must apply what they have learned to complete Make Your Case, an activity related to the Central Case, and relate it back to the chapter's Big Question.

Central
CASE

Make Your Case

The Central Case in this chapter explored the complex and urgent situation regarding water shortages in Nevada. Based on what you have learned, what do you think Nevada should do? Use examples from the Central Case and the lesson to support your ideas.

Additional assessments are available on MyEnvironmentalScience.com or the Classroom Resource DVD-ROM. These include Self Tests, Lesson Assessments, and two versions of the Chapter Test.

1) Only a very small portion of Earth's water is both liquid and (1 point)

A. fresh.

B. salty.

C. frozen.

D. underground.

[Next Question ➔](#)

Review

This guide provided a lesson walk-through of Environmental Science © 2011. It explained the planning tools available for each chapter. It also explained how to launch the study of a chapter. Finally, this guide introduced lesson features, inquiry activities, Study Workbook activities, and assessments.