

UNIT B: LESSON 4

LEARNING TARGETS

INSTRUCTIONS FOR TEACHERS:

- Refer students to the standards and objectives.
- Review the standards and objectives with students one at a time.
- At the end of the lesson, ask students what they did in class to meet the standards.

INSTRUCTIONS FOR STUDENTS:

Listen as your teacher reviews the standards and objectives. Your teacher will call on an individual or pair to explain what they mean.

Learning Target:

I can **analyze** the **interaction** between people and water in “Water is Life.”

Learning Target:

I can **articulate** how ideas **presented** in the text **clarify** the **issue** of water sustainability.

analyze – study something and explain it

interaction – how two things change one another

articulate – speak or write clearly about something

present – show

clarify – make something easier to understand

issue – subject

ACQUIRING AND USING VOCABULARY

INSTRUCTIONS FOR TEACHERS:

- Review student instructions.
- Familiarize students with their glossary. It is located in Appendix A (Glossary; labeled “Appendix: Glossary” in the student version). Tell students to use the glossary throughout the lesson.
- Pre-teach the vocabulary selected for extended instruction, provided as word cards in Appendix B (Teacher Resources). This vocabulary is abstract and critical to understanding the text.

INSTRUCTIONS FOR STUDENTS:

Your teacher will pre-teach several key words. Use your glossary for the rest of the lesson to find meanings for words you don't know. Words that are **bolded** in the text can be found in the glossary. The glossary is located in the Appendix at the end of the lesson.

THINKING LOG

INSTRUCTIONS FOR TEACHERS:

- Read the guiding question and text aloud to students, modeling appropriate pace and intonation.
- During the read-aloud, define words and phrases in context that students are unlikely to know, drawing definitions from the glossary when you can. Translations, examples, gestures, and visuals also help.
- Ask students to read the text on their own and work with a partner to answer supplementary questions.
- Ask students to use their glossary to help them with word meanings.
- Call on pairs to answer the supplementary questions.
- Discuss the guiding question(s) as a group and then have students write the answer in their student chart.

INSTRUCTIONS FOR STUDENTS:

Your teacher will ask you a guiding question that you will think about as your teacher reads the text aloud to you. As your teacher reads the text aloud, listen and follow along in your text. After the text has been read aloud, work with a partner to reread the text and answer the supplementary questions. Use your glossary to help you. Your teacher will review the answers with the class. You will then discuss the guiding question(s) with your teacher and the class. Finally, you will complete a written response to the guiding question(s).

GUIDING QUESTION: *What is the major dilemma (problem) Barbara identifies (sees) in human use of **resources** or useful things that are in the world like water? Why is this important?*

Water is Life

By Barbara Kingsolver

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Civilization has been **similarly** slow to give up on our **myth** of the Earth's **infinite** generosity. **Declining** to look for **evidence** to the **contrary**, we just knew it was there. We pumped **aquifers** and **diverted** rivers, trusting the twin lucky stars of **unrestrained** human **expansion** and endless **supply**. Now **water tables plummet** in countries **harboring** half the world's population. Rather grandly, we have overdrawn our accounts.

WORD BANK:

aquifers

limitless

rivers

water tables

infinitely

myth

water

SUPPLEMENTARY QUESTIONS:

1. In lesson 3, we read how scientists did not give up for centuries the idea that stars could be seen from the bottom of a well. What is another, similar myth (idea that is not true) that we humans do not want to give up?

We do not want to give up on the myth that the Earth is infinitely generous.

2. What does it mean to say that thinking the Earth is infinitely generous is a myth?

It means that the Earth does not have limitless resources. Resources, especially water, are limited.

3. What evidence (facts) is there that we have been ignoring how limited our water resources are?

We have pumped aquifers and diverted rivers. This has led to water tables plummeting (falling) for half the world's population.

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In 1968 the **ecologist** Garrett Hardin wrote a paper called "The Tragedy of the Commons," required reading for biology students ever since. It addresses the problems that can be **solved** only by "a change in human **values** or ideas of morality" in situations where **rational pursuit** of **individual self-interest** leads to **collective ruin**. Cattle farmers who share a common pasture, for example, will increase their herds one by one until they destroy the pasture by overgrazing. Agreeing to self-imposed limits instead, unthinkable at first, will become the right thing to do.

WORD BANK:

limit	pasture	self-interest	"The Tragedy of the Commons"
overgrazing	ruin	solved	values

SUPPLEMENTARY QUESTIONS:

4. What paper did Garrett Hardin, the ecologist, write?

Garrett Hardin wrote "The Tragedy of the Commons."

5. What problems does the paper address (talk about)?

It addresses problems that can only be solved (fixed) by changes in human values.

6. In what situations is there a need for change in human values?

There is a need for a change in human values in situations where self-interest leads to collective ruin (destruction of the community).

7. What is an example of changing human values so that self-interest does not lead to collective ruin?

An example is as follows: Cattle farmers will increase their herds (groups of cattle) until they destroy the pasture (grassland) by overgrazing (letting their cattle eat all the grass). If each cattle farmer agrees to limit the number of cattle, then the pasture will not be overgrazed. This would be the right thing to do, even if it is against the farmers' own self-interest.

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Water is the **ultimate** commons. But rules change. Time and again, from New Mexico's antique **irrigation** codes or rules to the UN Convention on International Watercourses, **communities** have studied water systems and **redefined** wise use. Now Ecuador has become the first nation on Earth to put the rights of nature in its **constitution** so that rivers and forests are not simply property but **maintain** their own right to **flourish**. Under these laws a citizen might file suit **on behalf of** an injured watershed, recognizing that its health is **crucial** to the common good. Other nations may follow Ecuador's lead. Just as legal systems once reeled to comprehend women or former slaves as fully entitled, law schools in the U.S. are now reforming their curricula with an eye to understanding and **acknowledging** nature's rights.

WORD BANK:

constitution	good	property	ruin
crucial	maintain	protecting	self-interest
flourish	on behalf of	rights	

SUPPLEMENTARY QUESTIONS:

8. *What is meant by "water is the ultimate commons"?*

"Water is the ultimate commons" because if we all pursue our self-interest and use up the water, it will lead to collective ruin when we run out.

9. *What is Ecuador the first nation to do?*

Ecuador has put the rights of nature in its constitution.

10. *What does this mean?*

This means that rivers and forests are not property (do not belong to anyone). They maintain their own right to flourish (grow and thrive).

11. *For example, what can a citizen in Ecuador do to protect an injured watershed (a watershed that is being destroyed)?*

An Ecuadorean citizen can file suit (make a legal complaint) on behalf of the watershed to protect it.

12. *Why might an Ecuadorean citizen file suit to protect an injured watershed?*

The citizen might file suit because protecting (helping) the watershed might be crucial for the common good of the whole community.

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On my desk, a glass of water has caught the afternoon light, and I'm still looking for wonders. Who owns this water? How can I call it mine when its fate is to run through rivers and living bodies, so many already and so many more to come? It is an **ancient**, dazzling **relic**, **temporarily** quarantined here in my glass, waiting to return to its kind, waiting to move a mountain. It is the gold standard of biological **currency**, and the good news is that we can **conserve** it in countless ways. Also, unlike petroleum, water will always be with us. Our trust in Earth's **infinite** generosity was half right, as every raindrop will run to the ocean, and the ocean will rise into the firmament. And half wrong, because we are not important to water. It's the other way around. Our task is to work out reasonable ways to **survive** inside its boundaries. We'd be wise to fix our sights on some new stars. The gentle nudge of **evidence**, the guidance of science, and a heart for **protecting** the commons: These are the tools of a new century. Taking a wide-eyed look at a watery planet is our way of knowing the stakes, the better to know our place.

WORD BANK:

ancient	living bodies	Petroleum	science
conserve	love	protect	water
courage	on behalf of	protecting	with us
evidence	owns	rivers	

SUPPLEMENTARY QUESTIONS:

13. *Barbara is looking at a glass of water, and she is asking a question. What question is she asking?*

Barbara is asking who owns the water in her glass.

14. *Can Barbara say that she owns the water? Why or why not?*

No, she cannot (Yes, she can/No, she cannot) call the water hers. This is because water is ancient, or very old, and runs through everything, like rivers and living bodies.

15. *What is the good news about water?*

The good news about water is that we can conserve (save) it. Water will always be with us.

16. *What is a resource that will not be with us forever?*

Petroleum (oil) is a resource that will not be with us forever.

17. *What are the tools of the new century that we can use to survive?*

The tools of the new century are evidence, science, and a heart for protecting the commons.

18. *What does “a heart for protecting the commons” mean?*

It means that humans will need to have the courage and love to protect the water on behalf of all of us on planet Earth.

RESPONSE TO GUIDING QUESTION(S):

What is the major dilemma (problem) Barbara identifies (sees) in human use of resources like water? Why is this important?

Suggested response: The major dilemma that Barbara identifies is that humans often act out of self-interest rather than for the collective good of the community. This is important because humans will only be able to flourish on Earth if we use evidence and science to understand the problem, and if we act on behalf of the common good of all of us on planet Earth.

WATER NOTE-CATCHER

INSTRUCTIONS FOR TEACHERS:

- Review student instructions.

INSTRUCTIONS FOR STUDENTS:

Work with a partner. Use your water note-catcher to write down key, or important, information from the text. You will write down main ideas and some details, or specific information, about each main idea. You can use information from your Thinking Log. Some information is already filled in for you.

WORD BANK:

acknowledge, acknowledges, aquifers, believe, constitution, contrary, crucial, evidence, infinite, limits, observe, protect, resource, resources, rivers, rules, running out, supply, survive, *Tragedy of the Commons*, water tables

Summary from yesterday:

People do not always look for evidence, or proof of what they believe. But we can observe or see what is happening.

Brief background:

There is a book called *Tragedy of the Commons*. It says if we all use as much of our resources as we want, the resources will be used up.

Main idea:

People treat water like it is infinite without observing evidence to the contrary, or opposite.

Supporting details:

We pump aquifers. We divert rivers. We trust in an endless supply of water. Now water tables are falling. We are running out of water.

Main idea:

Water is a common resource, so we need to protect it.

Supporting details:

People are starting to change rules about water. Ecuador acknowledges nature's rights in its constitution. Other countries acknowledge that water is crucial.

Conclusion:

Water is not infinite. Humans have to live within the limits of water to survive.

FUNCTIONAL ANALYSIS

INSTRUCTIONS FOR TEACHERS:

- Review student instructions for functional analysis with the whole class.
- Complete the functional analysis with the whole class.
- Have students work with a partner to rewrite the sentence in their own words.

INSTRUCTIONS FOR STUDENTS:

Work with your class to analyze an important sentence(s) from the text.

- Every sentence has someone or something that *does* something. First you determine this *who* or *what*.
- Every sentence has something that they *do* or *did*. Figure that part out next. Now you have the most important parts of the sentence in place.
- Then you will figure out what they did the action *to* or *for*.
- Finally, you will write the descriptive details.
- Write your answers in the spaces below.
- When you are done, write the sentence again in your own words.

You may want to use definitions from the glossed text in the sections above.

Functional Analysis:

Time and again, from New Mexico's antique irrigation codes to the UN Convention on International Watercourses, communities have studied water systems and redefined wise use.

WHAT (Actor): communities

WHAT HAPPENED (Action): *have* studied

WHAT (Recipient): *water* systems

TRANSITION: and

WHAT (Actor): [*they*]

WHAT HAPPENED (Action): [*have*] redefined

WHAT (Recipient): *wise* use

DETAIL (When): *time and* time again

DETAIL (Examples): *from New Mexico's* antique irrigation codes *to the* UN Convention on International Watercourses

What the sentence says:

My own words:

Communities

have studied

water systems

[*transition*] and

and

[<i>they have</i>]	the communities have
redefined	_____
wise use	using _____ wisely, or well
[<i>They have done this</i>] time and again	_____
from New Mexico's antique irrigation codes to the UN Convention on International Watercourses	Here are examples: _____ and _____
<p>Write the sentence in your own words and then explain it to your partner.</p> <p>Communities have _____</p> <p>and they have _____.</p> <p>They have done this _____.</p> <p>Here are examples: _____</p> <p>and _____.</p>	

EXIT TICKET

INSTRUCTIONS FOR TEACHERS:

- Review student instructions with the whole class.

INSTRUCTIONS FOR STUDENTS:

This graphic organizer will help you keep track of information about water for all of the readings. In the readings so far, we have learned four important lessons about water.

- First, describe, or write about, the importance of water.
- Next, describe the amount of water we have globally (*hint: are there limits to water?*)
- Then, describe how people use water.
- Finally, describe what we can do to save water for all people on earth (*so what?*).

Importance of water	Amount of water available globally	How people use water	So what?
Water is important because it is _____ for life.	Water is not _____.	People use too much water. They use water for _____ and _____ and _____ _____.	<i>[Write what we can do to save water for all people on Earth:]</i>

Appendix A: Glossary

Word	Definition	Example
<i>acknowledge</i>	accept or understand that something is true	Law schools in the U.S. are now reforming their curricula with an eye to understanding and acknowledging nature's rights.
aquifers	an area under the ground that has water we can drink	We pumped aquifers and diverted rivers, trusting the twin lucky stars of unrestrained human expansion and endless supply.
ancient	very old	Water is an ancient , dazzling relic.
collective	related to or involving a group of different individuals that are thought of as one	Rational pursuit of individual self-interest can lead to collective ruin.
communities	Groups of people who live in the same place or have the same interests.	Communities have studied water systems.
conserve	use something wisely and without wasting it; save it	The good news is that we can conserve water in countless ways.
<i>constitution</i>	the written record of a country's laws	Now Ecuador has become the first nation on Earth to put the rights of nature in its constitution .
<i>contrary</i>	opposite or totally different	Declining to look for evidence to the contrary , we just knew it was there.
<i>crucial</i>	very important	These laws recognize that water is crucial to the common good.
<i>currency</i>	something of value that can be exchanged, or traded	Water is the gold standard of biological currency .
<i>decline</i>	refuse or decide not to do something	Declining to look for evidence to the contrary, we just knew it was there.
divert* (diverted)	turn something in a different direction	We pumped aquifers and diverted rivers.

Word	Definition	Example
ecologist	a scientist who studies the relationships between living things and their environments	In 1968 the ecologist Garrett Hardin wrote a paper called "The Tragedy of the Commons."
<i>evidence</i>	facts; proof	Declining to look for evidence to the contrary, we just knew it was there.
<i>expand</i> (<i>expansion</i>)	grow larger	We trusted the twin lucky stars of unrestrained human expansion and endless supply.
flourish	grow and thrive; be healthy	Rivers and forests in Ecuador are not simply property but maintain their own right to flourish .
harbor*	protect or provide shelter for someone	Now water tables plummet in countries harboring half the world's population.
individual	a single person	Rational pursuit of individual self-interest can lead to collective ruin.
<i>infinite</i>	without limits; unending	Civilization has been similarly slow to give up on our myth of the Earth's infinite generosity.
<i>irrigation</i>	supplying water to land by man-made means.	Time and again, from New Mexico's antique irrigation codes or rules to the UN Convention on International Watercourses, communities have studied water systems and redefined wise use.
<i>maintain</i>	keep	Rivers and forests in Ecuador are not simply property but maintain their own right to flourish.
myth	a story or belief based on tradition	Civilization has been similarly slow to give up on our myth of the Earth's infinite generosity.

Word	Definition	Example
<i>on behalf of</i>	in someone else's place; representing someone	Under these laws a citizen might file suit on behalf of an injured watershed.
plummet	fall very fast	Now water tables plummet in countries harboring half the world's population.
protect	keep something from harm (keep it safe)	Protecting the commons is a tool of a new century.
pursuit		
<i>redefine</i>	decide what something means again	Time and again, communities have studied water systems and redefined wise use.
relic*	something saved from the past	Water is an ancient, dazzling relic .
rational	Sensible or intelligent	Rational pursuit of individual self-interest can lead to collective ruin.
resource	a useful thing that grows or exists in the world	Water is a useful resource .
ruin	destruction	Rational pursuit of individual self-interest can lead to collective ruin .
self-interest	acting for oneself instead of for the good of the community, or group	Rational pursuit of individual self-interest can lead to collective ruin.
<i>similar (similarly)</i>	almost the same	Civilization has been similarly slow to give up on our myth of the Earth's infinite generosity.
solve (solved)	fix or find an answer to a problem	The book addresses the problems that can be solved only by "a change in human values or ideas of morality."
supply	the amount of something that is available to be used	We pumped aquifers and diverted rivers, trusting in an endless supply of water.
<i>survive</i>	continue to live	Our task is to work out reasonable ways to survive inside its boundaries.

Word	Definition	Example
<i>task</i>	a piece of work to be done; duty	Our task is to work out reasonable ways to survive inside its boundaries.
<i>temporary</i> (<i>temporarily</i>)	lasting a short time; not permanent	It is an ancient, dazzling relic, temporarily quarantined here in my glass.
<i>ultimate</i>	fundamental or most essential	Water is the ultimate commons.
<i>unrestrained</i>	not held back by anything	We pumped aquifers and diverted rivers, trusting in unrestrained human expansion.
values	ideals or morals; ways of living that a person thinks are important	The book addresses the problems that can be solved only by "a change in human values or ideas of morality."
water table*	the level below which the ground is saturated with, or full of water	Now water tables plummet in countries harboring half the world's population.

*Vocabulary from the Expeditionary Learning lessons.
Italicized words are from the Academic Word List.

Appendix B: Teacher Resources

acknowledge



- People used to think that the sun revolves, or goes around, the earth. People thought this for a long time, even after scientists showed it was wrong. Now we all understand that the earth goes around the sun, like in the picture. We acknowledge that the earth goes around the sun.
- To acknowledge something is to accept it or understand that it is true.
- Partner talk: Think about something you used to believe about the world's water resources that you have changed your mind about. What made you acknowledge that you were wrong?

evidence



- Look at the picture. This girl thinks that there might be a problem with pollution, or waste, in a nearby lake. She is looking for evidence, or proof, that she is right.
- Evidence is what gives you proof, or reason to believe, that something is right. It shows you that something is true or real.
- Partner talk: What evidence might this girl find if there is pollution in the water?