

Water

Fact and Fiction

Water: Fact and Fiction

Student Objectives

I will be able to:

- Read and analyze literary texts (legends) and informational texts (interviews) about water's impact on society.
- Share ideas with my peers.
- Build my vocabulary knowledge.
- Conduct research to write an informational essay.

Tips for Text Annotation

As you read closely for different purposes, remember to annotate the text. Use the symbols below. Add new symbols in the spaces provided.

Symbol	Purpose
<u>underline</u>	Identify a key detail.
★	Star an important idea in the margin.
① ② ③	Mark a sequence of events.
○magma○	Circle a key word or phrase.
?	Mark a question you have about information in the text. Write your question in the margin.
!	Indicate an idea in the text you find interesting. Comment on this idea in the margin.

Your annotations might look like this.

3 Madison argued for a strong central government. At
 the time, the thirteen states had a lot of power to govern
 themselves. This made it hard for a national government
 to collect taxes or create a military. After months of
 discussion and debate, and many compromises the
 delegates decided on a final document. They mostly
 followed Madison's Virginia Plan and established a
 stronger federal government.

4 Madison also helped write a series of newspaper
articles called the Federalist Papers. These articles helped
persuade readers to accept the new Constitution.

5 ③ Soon after, Madison helped create the Bill of Rights.
 These are the first ten amendments, or additions, to the

Notes

What power
did the sides
have?

Find out more
about the
Virginia Plan

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Essential Question

What does water mean to people and the societies they live in?





Remember
to annotate
as you read.

Notes

The Water Famine

a Native American Legend retold by Gare Thompson

The Penobscot Indians from central Maine are one of many Native American tribes that formed the Wabanaki Confederacy. The tribal name means “rocky point.” The tribe lived along the south branch of the Penobscot River that flows into the Atlantic Ocean.

- 1 A long, long time ago, a mean Monster Bullfrog controlled the river. He forbade the people from using its waters, which turned fatal for some who died of thirst. The people called on their Spirit Chief, Gluskabe, to help them. When he saw how sickly his people seemed, he asked, “What is your trouble?”
- 2 “The Monster Frog is killing us. He forbids us water to drink or to use for our crops,” they said in weakened voices. Their throats were as dry and parched as brush in high summer.
- 3 “I will make him give you water,” Gluskabe replied. “Come with me.” So the people went with their Chief to see the Monster Frog.

The Penobscot
River flows through
central Maine.

Notes



This statue was built outside the Mi'kmaq Museum in Nova Scotia. It honors Gluskabe, sometimes spelled Glooscap, the cultural hero of many Native American groups in the Northeast, including the Wabanaki Confederacy and Algonquin Nation.

4 “Why do you abuse our grandchildren?” the Chief asked the frog. “You will be sorry for this treatment of our good people. I will give them water, so all will have an equal share. The benefits should be for all living creatures.”

5 As fast as a bee taking nectar, Gluskabe grabbed the Monster Bullfrog and pushed down his back with one great shove. (From thenceforth, all bullfrogs are broken-backed.) And yet, the Monster Frog did not give up the water. So Gluskabe took an axe and cut down

a large yellow birch tree. When it fell down, the yellow birch tree obliterated the Monster Bullfrog.

6 The water from the river flowed over the many branches of the yellow birch tree. And that is how the Penobscot River originated. Each branch became its own stream and tributary and they all emptied into the main Penobscot River. The water famine was ended forever.

7 Now all of the Penobscot Indians were so thirsty, some even near death, that they jumped into the river. They drank, they splashed, they swam joyously. Some of the people were so happy and grateful for water they turned into fish. Some turned into turtles, others became frogs.

8 Others stayed on land but never living far from the river that was the central point to their lives.

Remember
to annotate
as you read.

Water-Wise Landscaper



a **Climate Kids** interview
with **Michelle Pekko-Seymoure**

Notes

Michelle Pekko-Seymoure is a landscape designer and ornamental horticulturist (someone who works with plants) who specializes in creating natural environments in desert areas. A desert is a type of habitat that typically gets less than twenty inches of rainfall a year. Water, of course, is very important in a desert. Therefore, Michelle plans gardens in ways that use as little water as possible. Climate Kids, which is part of NASA's (National Aeronautics and Space Administration) Jet Propulsion Laboratory, conducted the following interview.

- 1 **Climate Kids:** Michelle, why should people care how much water they use on their yards or gardens?
- 2 **Michelle:** In many regions, water is scarce. Some cities covered in green lawns and spouting fountains are actually in the middle of dry deserts with little rainfall.
- 3 **CK:** But we don't need rain. We can turn on the sprinklers and give our pretty lawns as much water as they need. Right?

Phoenix, Arizona, is
a large desert city.



4 **Michelle:** No. In order to live in these places, people have to dig deep wells to find water. Or they have to pipe water in from lakes or reservoirs. City dwellers often forget that they need to conserve water so they don't run out completely.

before xeriscaping . . .



. . . and after



5 **CK:** We have had a drought in Southern California for several years. But that's just temporary, right?

6 **Michelle:** Not in the long run. Earth's climate is getting warmer, so drought will probably become much more common and severe! For many regions, global warming means less snowfall in the winter, so less water in lakes and reservoirs.

7 **CK:** So, back to landscaping, I guess we should all just let our lawns turn brown.

8 **Michelle:** Not at all! That's the great thing about xeriscaping.

9 **CK:** Zer-i-what's-it?

10 **Michelle:** Xeriscaping is the creation of beautiful, natural-looking landscapes that need very little water. We use water-conserving techniques and irrigation.

11 **CK:** What plants don't need water?

12 **Michelle:** You can find out by looking at what plants and wildflowers grow where you live, or in other places with similar climates. For us, in Southern California, that would be the region around the Mediterranean Sea, as well as some coastal areas of South Africa, Australia, and Chile.

13 **CK:** That must include a lot of plants.

14 **Michelle:** Yes! Not all of them are so easy to buy here, but we have lots to choose from.

15 **CK:** What about grass?

16 **Michelle:** Most nice, grassy lawns need tons of water to stay green. Some kinds of grass do take less water. You can also have a lawn substitute. Yarrow and some native sedges are soft to walk on, need little water, and don't need to be mowed. But you don't really need a lawn at all.

17 **CK:** No lawn? Then where would we play? And where would the dog . . . you know.

18 **Michelle:** Okay, for children and pets, you could have a small lawn area—say in the backyard. But the rest of the yard could be designed with only drought-tolerant plants such as lavender, rosemary, beautiful tall grasses, wildflowers, cactus, succulents, and lots more.

19 **CK:** Could you even walk through a yard with these kinds of plants?

20 **Michelle:** Absolutely! You could have curving, natural-looking pathways with flat stones or gravel to walk on. Sometimes we create a little dry creek bed with smooth river rocks winding through the plants. We make people's yards look like nature at its most beautiful! These landscapes are much nicer homes for wildlife, too, such as insects, birds, squirrels, and rabbits.



**schoolchildren in the
Namib Desert, Africa,
at work on their garden**

Notes



- 21 **CK:** And these plants never need to be watered?
- 22 **Michelle:** They may need some water at first. But once their roots are established, usually rain is enough.
- 23 **CK:** Are there any other ways you help with climate change in your job?
- 24 **Michelle:** We also help people set up water-efficient vegetable, fruit, and herb gardens. By growing their own food, people prevent a lot of carbon dioxide from getting into the air, because no trucks or planes are needed to deliver their food from far away. Also, their plants take carbon dioxide out of the air.
- 25 **CK:** How did you learn to do all this?
- 26 **Michelle:** I studied horticulture in college. Horticulture is the art and science of growing plants.
- 27 **CK:** Your job sounds like fun. What do you like most about it?
- 28 **Michelle:** I love being outdoors! I love creating fun landscapes tailored to people's likes and dislikes. I love teaching people to be responsible with the environment.
- 29 **CK:** It sounds like we can all be horticulturists in a small way. Thanks for being such an inspiration, Michelle!

*Remember
to annotate
as you read.*

Notes

Pecos Bill and the Tornado

- 1 Pecos Bill was the roughest, toughest cowboy in the West. When Bill was just a baby, he tumbled out of his parents' covered wagon and landed smack-dab in the middle of West Texas. Bill's parents didn't realize he was gone until it was too late. Luckily for Bill, a pack of coyotes found him and raised him as their own. After that experience, nothing scared Pecos Bill—and no exploit was too outlandish!
- 2 By the time he was ten, Pecos Bill had tamed wild horses and ridden bareback on a mountain lion. What would he do next? Why, he'd ride a huge whirling tornado, that's what! Back then, the West was in the middle of a terrible drought. In fact, the area was so devoid of moisture, livestock were dehydrating and blowing around like big brown tumbleweeds! So when a ferocious tornado rumbled into the area, Bill jumped at the opportunity to end the drought. "I'll catch that noisy twister and squeeze the water out of it," Bill vowed.
- 3 Quick as lightning, Bill grabbed his lasso, roped the rotating spout, and hoisted himself onto it with a joyful whoop. The tornado bucked like a bronco and growled louder than the meanest mountain lion, but Bill just sat back and enjoyed the ride. As Bill rode the tornado across Texas, New Mexico, and Arizona, he used his powerful hands to squeeze water from it. The water showered down on the parched soil and everyone cheered. Finally the tornado ran out of steam and dumped Bill in California. But when Bill fell from the sky, he hit the ground so hard he made an enormous dent. Today we call that great depression Death Valley. It's the lowest place in the entire Western Hemisphere!

BuildReflectWrite

Build Knowledge

Answer the following questions from this week's readings.

The Water Famine	Water-Wise Landscaper
What do you think would happen if Gluskabe didn't fight the Monster Bullfrog?	What facts would you select to support the idea that xeriscaping is the right type of landscaping for a desert area?

Reflect

What does water mean to people and the societies they live in?

Based on this week's texts, write down new ideas and questions you have about the essential question.

Research and Writing

Informative/Explanatory

Earth's water supply is endangered by many factors, such as pollution, overconsumption, and climate change. Research one of these threats and write an informational essay about how people are responding to the threat.

Choose Your Topic:

Conduct a pre-search to identify a threat to Earth's water supply that you would like to research in depth. Construct three or more guiding questions that will help you focus your research on the information you will need to write your essay.

Remember
to annotate
as you read.

Notes

The Pagoda on the Hill of the Imperial Springs

an excerpt from *Myths and Legends of China*

by E. T. C. Werner

The following legend tells how Peking¹ was developed in the fourteenth and fifteenth centuries under the Ming dynasty. In Chinese culture, dragons are often associated with water, specifically as a force that controls rain.

A Drought and Its Cause

¹ While everything was thus tranquil in the new city of Peking, a sudden and untoward event occurred that spread dismay and consternation on all sides. One day when the Prince of Yen² went into the hall of audience, one of his ministers reported that “the wells are thirsty and the rivers dried up.” There was no water, and the people were all in the greatest alarm. The Prince at once called his counselors together to devise some means of remedying this disaster and causing the water to return to the wells and springs. However, no one could suggest a suitable plan. No one knew how to solve this horrible problem.

¹ Peking—the old name for Beijing, a main city of China

² Prince of Yen—also known as Prince of Yan, or Zhu Di, the Yongle Emperor (1360–1424)

Notes

- 2 It is necessary to explain the cause of this scarcity of water. There was a dragon's cave outside the east gate of the city. The place was called "Thunderclap Mouth." Now, very few people went there and none had spoken of the dragon as the dragon had not been seen for myriads of years.
- 3 Still, it was well known that he lived there. Everyone believed the cave was the home of the dragon and that the dragon was somehow responsible for the drought. What could have made the dragon angry? At last, the answer was revealed.
- 4 In digging out the earth to build a wall for the new city, some workmen had broken into this dragon's cave. They thought little of the consequences that would result. The workers simply carried on and built the wall.

The palace the Prince of Yen built in Beijing still stands today and is called the Forbidden City. It covers 2.6 million square feet (242.5 thousand square meters) and contains 9,999 rooms. When the royal family lived there, only guests were allowed to enter, but today it is a popular tourist attraction.



This portrait of the Prince of Yen is ink and color on silk. It is a hanging scroll. Today it is located in the National Palace Museum in Taipei, Taiwan.

Notes



- 5 The dragon was exceedingly angry. He became determined to shift his abode, but the she-dragon said: “We have lived here thousands of years, and shall we suffer the Prince of Yen to drive us forth thus? If we do go, we will collect all the water and place it into our yin-yang baskets³. And at midnight we will appear in a dream to the Prince. In the dream, we will request permission to retire. If he gives us permission to do so, and allows us also to take our baskets of water with us, he will fall into our trap.”
- 6 Here the she-dragon smiled mercilessly, then continued: “For we shall take the water with his own consent. That will be our revenge. The people will have no water. And without water, they will perish. Water is the one thing all humans need.”

³ yin-yang baskets—baskets used for drawing water; yin-yang means a balance of forces.

The Prince's Dream

- 7 The two dragons then transformed themselves into an old man and an old woman, went to the chamber of the Prince, who was asleep, and appeared to him in a dream. Kneeling before him, they cried: "O Lord of a Thousand Years, we have come before you to beg leave to retire from this place, and to beseech you out of your great bounty to give us permission to take these two baskets of water with us."
- 8 The Prince readily assented, little dreaming of the danger he was incurring. The dragons were highly delighted. They immediately hastened out of his presence. Then they filled the baskets with all the water there was in Peking. Finally, they carried the baskets of water off with them.



Dragon-statue rain spouts are common in the Forbidden City. Dragons are often associated with water in Chinese legends.



- 9 When the Prince awoke, he paid no attention to his dream till he heard the report of the scarcity of water. Then reflecting on the singularity of his dream, he thought there might be some hidden meaning in it. He therefore had recourse to study his dream again. He discovered that his dream-visitors had been dragons, who had taken the waters of Peking away with them in their magic baskets. His dream, however, contained directions for the recovery of the water. So at once, he prepared to follow them.

The Pursuit of the Dragons

- 10 In haste the Prince donned his armor. Then he mounted his black steed. Next, spear in hand, he dashed out of the west gate of the city. He pressed on his horse, which went swift as the wind. He did not slacken speed till he came up with the water-stealing dragons. The two still retained the forms in which they had appeared to him in his dream. On a cart were the two identical baskets he had seen. And in front of the cart, dragging it, was the old woman. And pushing it from behind was the old man.



An Unexpected Flood

11 When the Prince saw the old man and woman he galloped up to the cart. As quick and as strong as lightning, he thrust his spear into one of the baskets. It made a great hole, out of which the water rushed so rapidly that the Prince was much frightened. He dashed off at full speed to save himself from being swallowed up by the waters, which in a very short time had risen more than thirty feet and had flooded the surrounding country. On galloped the Prince, followed by the roaring water, till he reached a hill, up which he urged his startled horse. When he gained the top he found that it stood out of the water like an island, completely surrounded; the water was seething and swirling round the hill like a great serpent, but no vestige could he see of either of the dragons.

“The Nine Dragon Screen” (wall) is more than 6 meters (20 feet) tall and 27 meters (89 feet) long. It is made of glazed tiles and was built in the 1400s. It is in a park near the Forbidden City.





The Jade Peak Pagoda, in the Summer Palace in Beijing, overlooks the Jade Spring Hill.

Notes

The Waters Subside

- 12 The Prince was very much alarmed at his perilous position, when suddenly a Buddhist priest appeared before him, with clasped hands and bent head, who bade him not to be alarmed, as with Heaven's assistance he would soon disperse the water. Hereupon the priest recited a short prayer or spell and the waters receded as rapidly as they had risen, and finally returned to their proper channels.

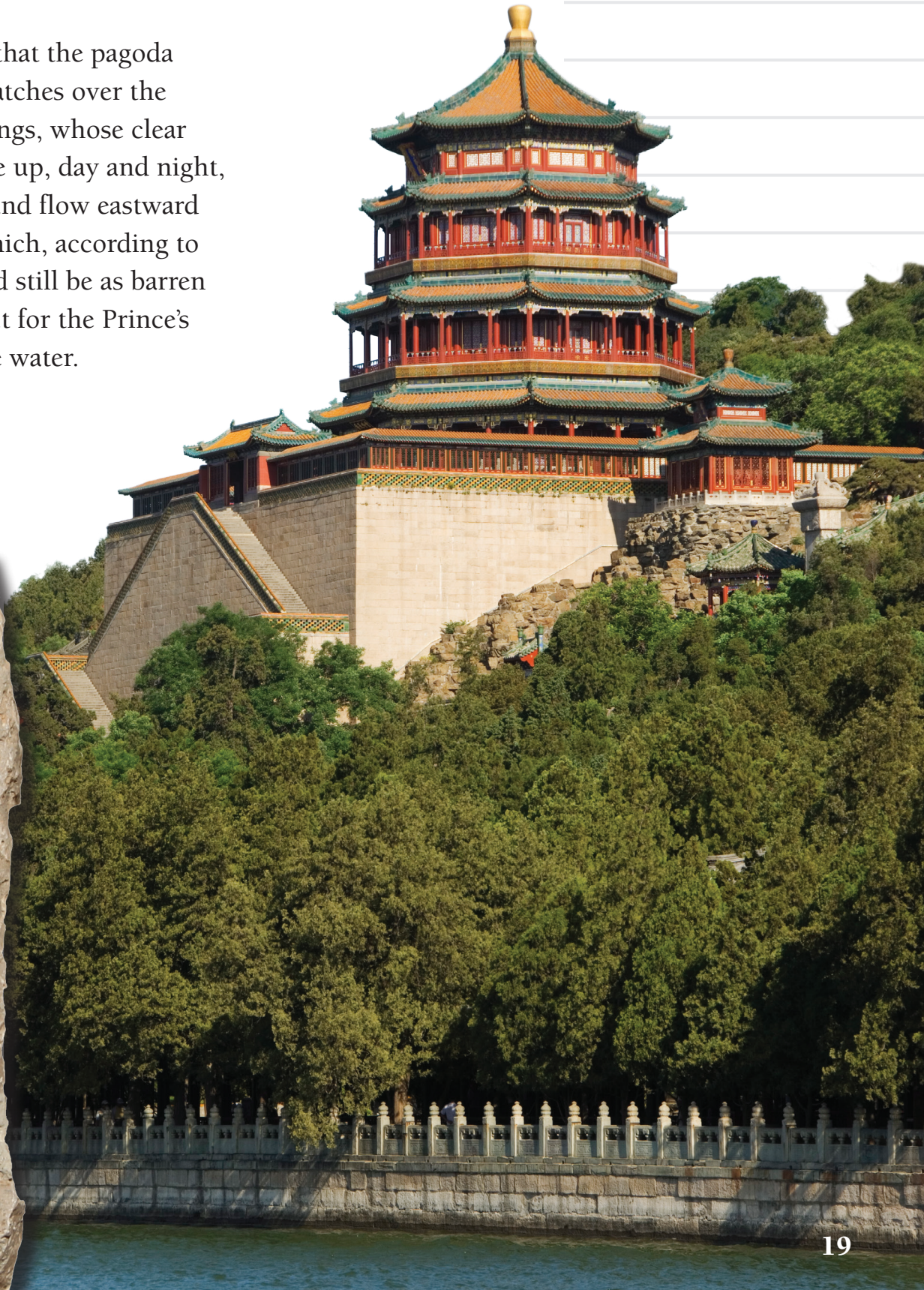
The Origin of the Fountain

- 13 The broken basket became a large deep hole about half an acre wide. In the center was a fountain, which threw up a vast body of water as clear as crystal. From the midst of this there arose a pagoda that rose and fell with the water. It floated on the top like a vessel. The spire thrust itself far up into the sky. It swayed about like the mast of a ship in a storm.

14 When the Prince returned to the city, he was hailed as its savior. On all sides he was greeted by crowds, whose cheering was as loud as the rushing fountain. Since that time, Peking has never had the misfortune to be without water.

15 It is said that the pagoda on the hill watches over the Imperial Springs, whose clear waters bubble up, day and night, unceasingly and flow eastward to Peking, which, according to legend, would still be as barren as a desert but for the Prince's pursuit of the water.

The Tower of Buddhist Incense pagoda is also in the Summer Palace. Though built several hundred years after the Prince of Yen's death, it resembles the pagoda described in this story.



*Remember
to annotate
as you read.*

Notes

Why the Ocean Has Tides

- 1 Raven and his people, the Tlingit, lived near the Big Water; this was before the ocean had tides. In both sunny and stormy weather, the Tlingit searched for seafood on the shore. They never ventured into the water for their food, however, because the ocean was too deep.
- 2 One night in a dream, Raven visualized a woman who controlled the ocean level using a tide line on her lap. Raven was determined to find that mysterious woman. “If I can persuade her to release the line,” Raven thought, “the Big Water will recede and we can gather more seafood!”
- 3 So Raven flew to the end of the world to find the woman. Using his excellent vision, he found her inside a cave, holding the tide line securely across her lap. Now Raven had tricked the cleverest audiences, so he thought he could outsmart this woman. Clever Raven proceeded to mumble to himself outside the cave in a barely audible voice. When the woman leaned forward to hear what Raven was saying, he kicked up sand. The woman could not see momentarily and she dropped the line.
- 4 “You’ve outsmarted me,” the woman exclaimed, “but you’ve also made a dangerous mistake! Now the Big Water has dropped so low, all the ocean creatures will soon die. Then your people will have no seafood at all. But if you help me clear the sand from my eyes, I will agree to control the water in a uniform way.”
- 5 Raven apologized for his trick and complied with the request. From that day forward, the woman released the tide line from time to time so the water would fall back. Then she pulled the line tightly so the water would rise again. And so the ocean had regular tides, and life was transformed for Raven’s people.

BuildReflectWrite

Build Knowledge

How would you adapt the two legends to create different endings for them?

	The Pagoda on the Hill	The Water Famine
New Problem		
New Solution		

Reflect

What does water mean to people and the societies they live in?

Based on this week's texts, write down additional ideas and questions you have about the essential question.

Research and Writing

Informative/Explanatory

Earth's water supply is endangered by many factors, such as pollution, overconsumption, and climate change. Research one of these threats, and write an informational essay about how people are responding to the threat.

Conduct Research:

Use your guiding questions to conduct research this week. Gather information from at least three sources, including both print and online sources. You may also wish to interview an expert. Use your sources to plan your informational essay.

Remember
to annotate
as you read.

Notes

Questions and Answers About the Oceans

a Climate Kids article

Oceans—those vast bodies of salty water that cover most of our planet—help make Earth unique in our solar system. Oceans have played an important role in physically shaping all aspects of Earth. This article about the oceans was produced by the Earth Science Communication Team at NASA, for the Climate Kids website. It explores some of the frequently asked questions about oceans.

Question #1: Why is the ocean important?

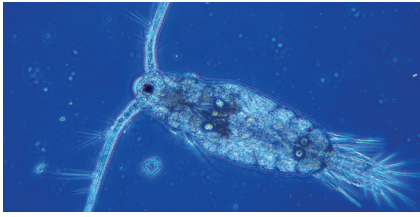
- 1 After all, we live on land.
- 2 But our world is a water world, and the ocean covers 70 percent of Earth's surface. The average depth of the ocean is 2.7 miles (4.35 kilometers). In some places, the ocean is deeper than the tallest mountains are high! The ocean contains about 97 percent of all the water on Earth.
- 3 The ocean plays a starring role in whatever happens with the environment. One big part of its role is to soak up energy (heat) and distribute it more evenly around Earth. Another part is to soak up carbon dioxide, or CO₂.



Earth is 70 percent water.

Question #2:

How does the ocean soak up energy?



plankton as seen under an optical microscope

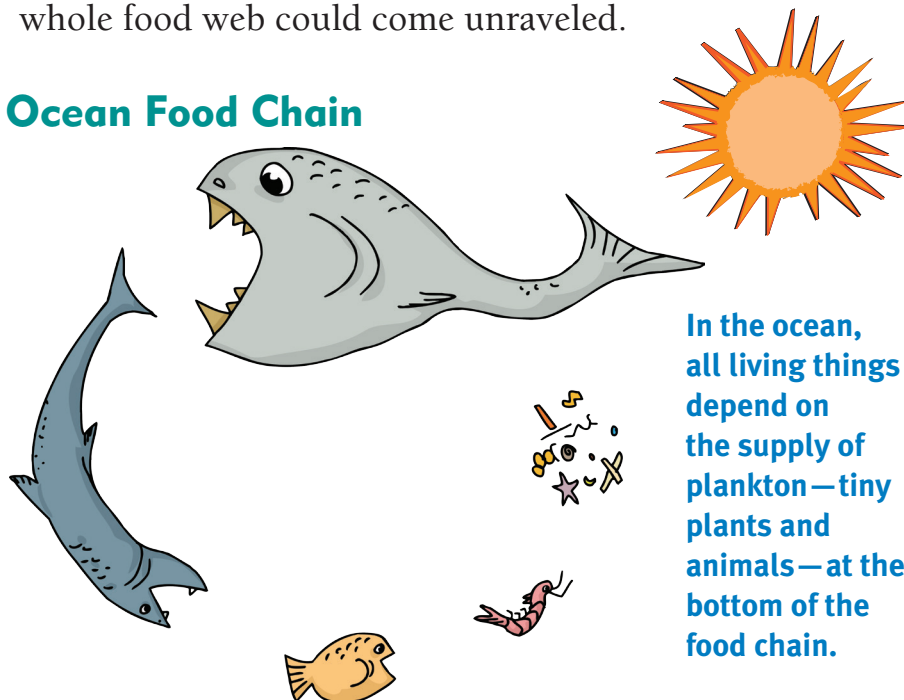
4 The ocean does an excellent job of absorbing excess heat from the atmosphere. The top few meters of the ocean store as much heat as Earth's entire atmosphere.

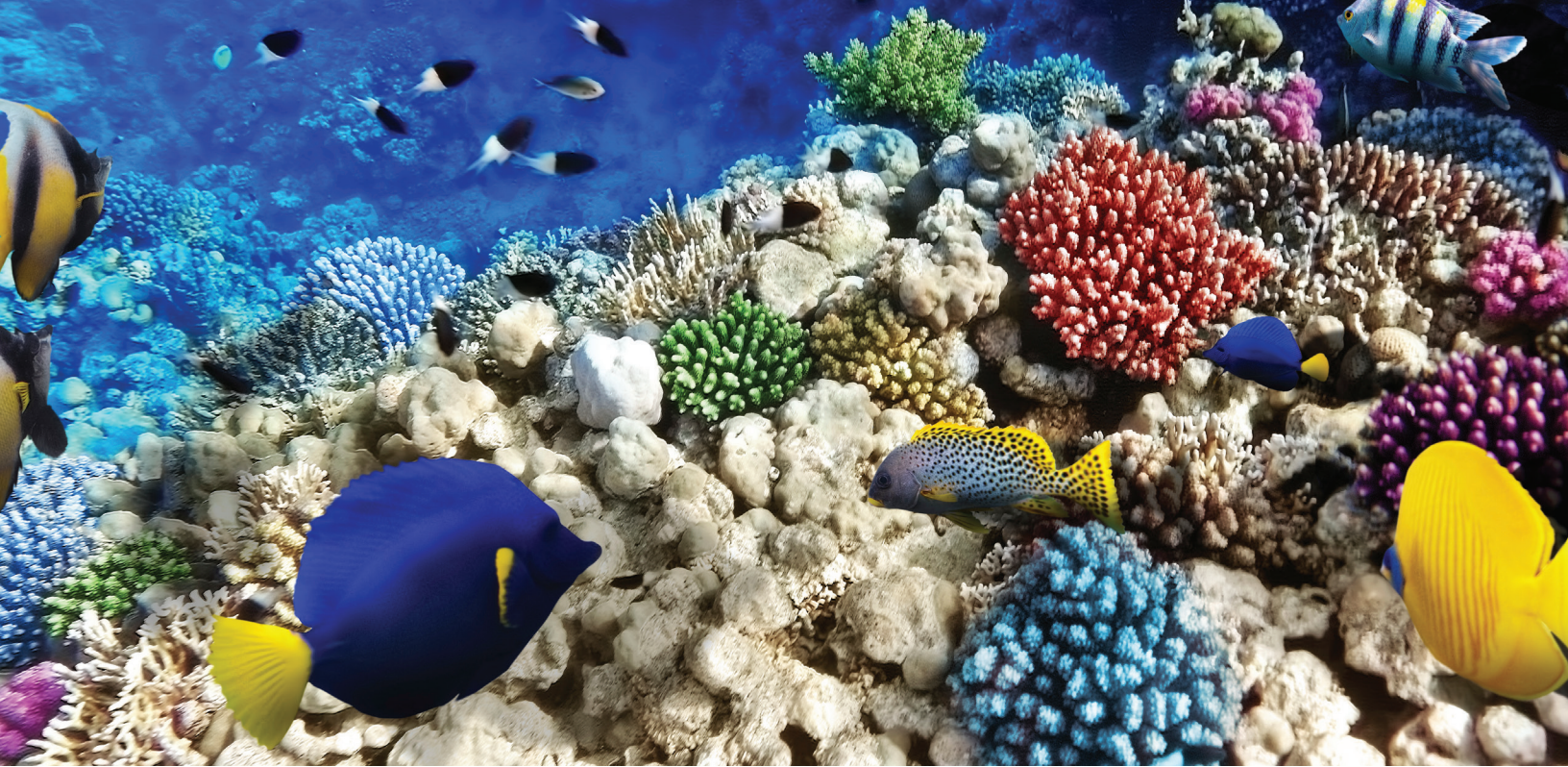
So, as the planet warms, it's the ocean that gets most of the extra energy.

5 But if the ocean gets too warm, then the plants and animals that live in it must adapt—or die.

6 Algae and plankton are at the bottom of the food chain. Plankton includes many different kinds of tiny animals, plants, and bacteria that just float and drift in the ocean. Other tiny animals such as krill—sort of like little shrimp—eat the plankton. Fish, and even whales and seals, feed on the krill. In some parts of the ocean, krill populations have dropped by more than 80 percent. Why? Krill like to breed in really cold water near sea ice. What would happen if there were no sea ice? What would happen if there were very little plankton or krill? The whole food web could come unraveled.

Ocean Food Chain

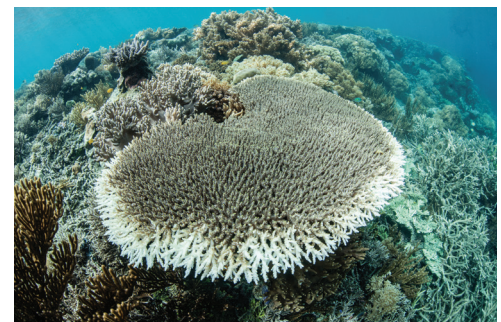




Corals are an example of animals living in harmony with plants, their environment, and each other.

Notes

- 7 Corals are another ocean organism in trouble. Coral is a very fragile animal that builds a shell around itself. It lives in harmony with a certain kind of colorful algae. The algae make food using sunlight through a process called photosynthesis. They share the food with the coral, and in turn, the coral gives the algae a safe and sunny place to live. The two of them get along fine, living in clean, clear, shallow waters where the sun shines through brightly. Fish love coral too, because there are lots of nooks and crannies for them to hide in.
- 8 But the algae cannot carry out photosynthesis in water that is too warm. The algae either die, or the coral spits it out. Scientists are not sure exactly what happens, but it's bad for the algae, the coral, and the fish. The corals lose their colorful food sources and become weak. This sad event is called coral bleaching, and it is happening on a grand scale in many places around the world.



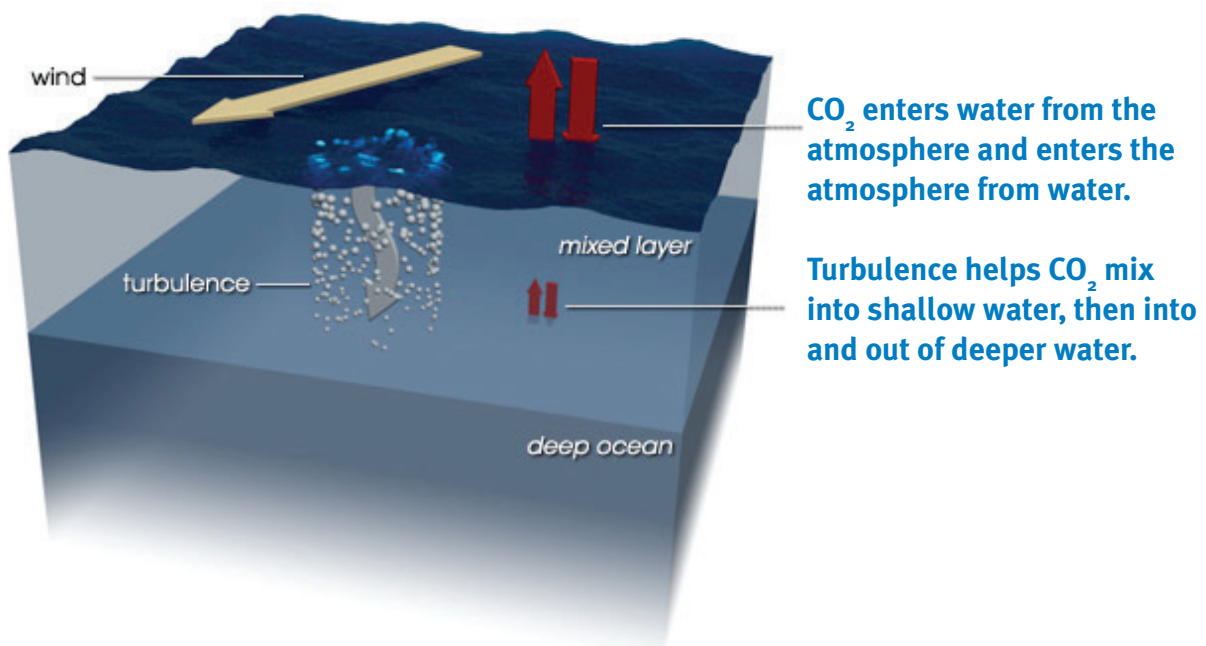
This coral has lost its algae, and thus its food source. It is sick and will probably die.

Question #3:

How does the ocean soak up CO₂?

- 9 Fish and other animals in the ocean breathe oxygen and give off carbon dioxide (CO₂), just like land animals. Ocean plants take in the carbon dioxide and give off oxygen, just like land plants. The ocean is great at sucking up CO₂ from the air. It absorbs about one-quarter of the CO₂ that we humans create when we burn fossil fuels (oil, coal, and natural gas). If not for the ocean, we'd be in even worse trouble with too much CO₂.
- 10 The ocean absorbs carbon dioxide from the atmosphere wherever air meets water. Wind causes waves and turbulence, giving more opportunity for the water to absorb the carbon dioxide.
- 11 However, the ocean and everything in it are paying a price. The ocean is becoming more acidic. What does this mean? Liquids are either acid or alkaline. Each liquid falls somewhere along a pH scale with acid at one end and alkaline (bases) at the other.

How CO₂ Gets into Water

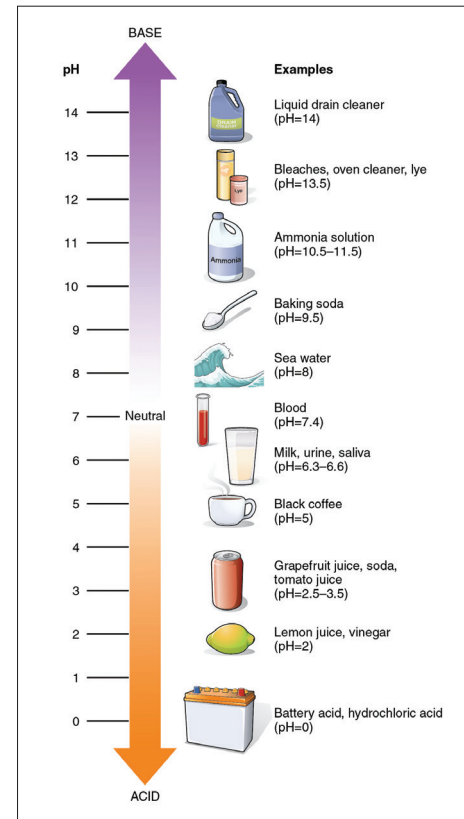


12 Lemon juice is an example of an acidic liquid. Bleach is alkaline. The ocean is slightly alkaline. The chart at right shows acids and bases (alkalines).

13 Normally, ocean water is less acidic than fresh water. Unfortunately, as the ocean absorbs more and more carbon dioxide from the atmosphere, it becomes more acidic.

14 That's problematic. The alkalinity of the ocean is very important in maintaining a delicate balance needed for animals—like the mussels in the picture below—to make protective shells. If the water is too acidic, the animals may not be able to make strong shells. Corals could also be affected, since their skeletons are made of the same shell-like material.

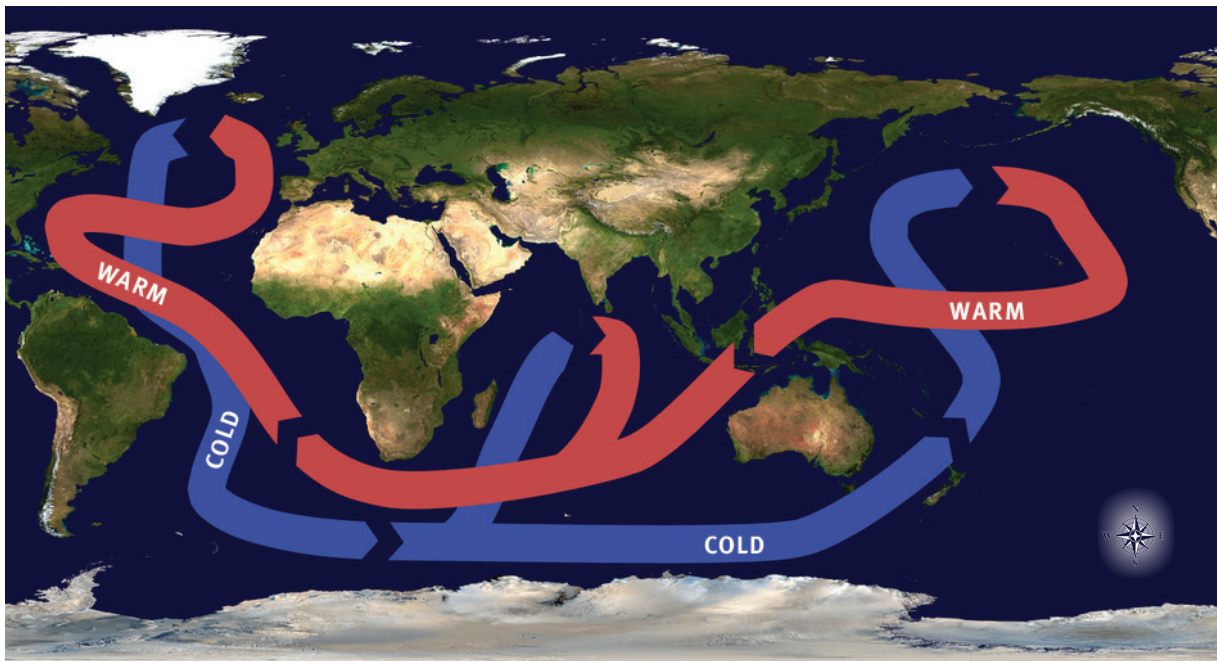
The pH Scale



Animals like these mussels cannot make strong shells if the ocean is too acidic.

Question #4:**How does the ocean affect the climate?**

- 15 One way the ocean affects the climate in places like Europe is by carrying heat to the north in the Atlantic Ocean. Way up north, cold water in the North Atlantic ocean sinks very deep and spreads out all around the world. The sinking water is replaced by warm water near the surface—which moves to the north. Scientists call this the “great ocean conveyor belt.” The heat carried north helps keep the Atlantic Ocean warmer in the wintertime, which warms the nearby countries as well.
- 16 NASA missions that very accurately measure the hills and valleys in the ocean, as well as changes in sea level, help scientists understand what is happening with ocean currents.



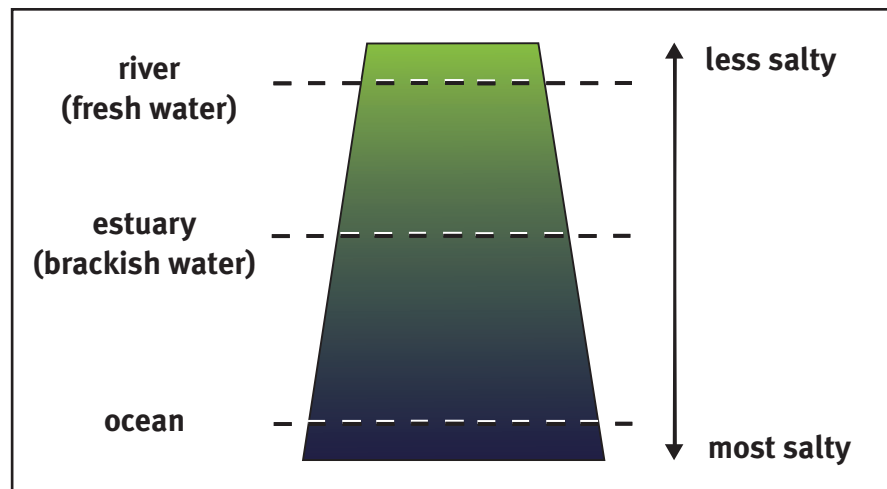
The “great ocean conveyor belt” refers to the major ocean currents that move warm water from the equator to the poles and cold water from the poles back toward the equator.

Question #5:

Does the salt in the ocean do anything?

- 17 The great ocean conveyor belt also carries warmer, less salty water from the equator to the poles, and moves colder, saltier water from the poles back toward the equator. Colder water and very salty water are heavier than warmer water and less salty water.

Fresh water has lower salinity (saltiness) than estuary water, where the ocean water mixes with river water. The ocean itself is most salty of all.



river

Notes

- 18 The amount of salt in ocean water affects currents as well. Saltier water is heavier than less salty water. When salty ocean water freezes, the ice can no longer hold on to the salt. Instead, the salt mixes with the water below, making it saltier and heavier. Glaciers, land ice, and icebergs are made of fresh water, so what happens when this ice melts?
- 19 The water in the North Atlantic sinks because it's cold, but also because it's salty. Being both cold *and* salty makes it really heavy, so it can sink very far. But if too much ice melts in the North Atlantic, the water could become less salty. If that happens, what about the ocean conveyor belt? Would it stop warming the North Atlantic? Could Europe get really cold? Scientists say it seems unlikely, but NASA satellites are keeping a close eye on the melting ice and the ocean currents to try to understand this complicated system better.

Oceans not only give Earth its blue hue and make our planet unique, but they also affect the air, the land, and all bodies of water on it.



estuary

ocean

Word Study Read

*Remember
to annotate
as you read.*

Notes

The Great Barrier Reef

- 1 Off the northeastern coast of Australia lies one of the largest natural wonders of the world. Big enough to be seen from space, the Great Barrier Reef is not just one reef. It is an expansive complex of many reefs, islands, and sandy shoals. Hundreds of different types of corals make up the Great Barrier Reef, and the diversity of marine life is impressive. In addition, the Great Barrier Reef is an important breeding ground for seabirds and turtles.
- 2 The Great Barrier Reef attracts visitors from around the world. The first European to explore the area was Captain James Cook in 1770. Unfortunately for Cook, his ship ran aground there. Today's visitors are luckier. Modern visitors can sail, swim, fish, and snorkel in the beautiful waters. They can visit a peaceful rain forest, explore idyllic islands, visit historic shipwrecks, and view colorful fish through a glass-bottom boat.
- 3 But there is a problem. The water off the shore of northeastern Australia has been perfect for corals—clear, warm, and sunny. But as our climate changes and global temperatures rise, corals in the Great Barrier Reef are at risk. Coral polyps are dependent upon algae for food. When the water around a coral reef gets too warm, it affects the algae. In turn, the coral is affected. Coral bleaching takes place. In the past, mass coral bleaching has occurred in the Great Barrier Reef. Most corals can recover, yet scientists are far from optimistic. They are confident that there is a link between climate change and coral bleaching. They also know that the effects of coral bleaching are cumulative.
- 4 Designated a World Heritage site in 1981, the Great Barrier Reef is truly one of the world's greatest natural treasures. Let's hope we can keep it that way.

BuildReflectWrite

Build Knowledge

What information in the graphics helped you interpret then apply concepts from the text? How?

Ocean Food Chain	pH Scale	Other

Reflect

What does water mean to people and the societies they live in?

Based on this week's texts, write down additional ideas and questions you have about the essential question.

Research and Writing

Informative/Explanatory

Earth's water supply is endangered by many factors, such as pollution, overconsumption, and climate change. Research one of these threats, and write an informational essay about how people are responding to the threat.

Write Your Informative Essay:

Use your research results to draft, revise, and edit your essay. Share your essay with your peers.

Support for Collaborative Conversation

Discussion Prompts

Express ideas or opinions . . .

When I read _____, it made me think that _____.

Based on the information in _____, my [opinion/idea] is _____.

As I [listened to/read/watched] _____, it occurred to me that _____.

It was important that _____.

Gain the floor . . .

I would like to add a comment. _____.

Excuse me for interrupting, but _____.

That made me think of _____.

Build on a peer's idea or opinion . . .

That's an interesting point. It makes me think _____.

If _____, then maybe _____.

[Name] said _____. That could mean that _____.

Express agreement with a peer's idea . . .

I agree that _____ because _____.

I also feel that _____ because _____.

[Name] made the comment that _____, and I think that is important because _____.

Respectfully express disagreement . . .

I understand your point of view that _____, but in my opinion _____ because _____.

That is an interesting idea, but did you consider the fact that _____?

I do not agree that _____. I think that _____ because _____.

Ask a clarifying question . . .

You said _____. Could you explain what you mean by that?

I don't understand how your evidence supports that inference. Can you say more?

I'm not sure I understand. Are you saying that _____?

Clarify for others . . .

When I said _____, what I meant was that _____.

I reached my conclusion because _____.

Group Roles

Discussion Director:

Your role is to guide the group's discussion and be sure that everyone has a chance to express his or her ideas.

Notetaker:

Your job is to record the group's ideas and important points of discussion.

Summarizer:

In this role, you will restate the group's comments and conclusions.

Presenter:

Your role is to provide an overview of the group's discussion to the class.

Timekeeper:

You will track the time and help to keep your peers on task.

Making Meaning with Words

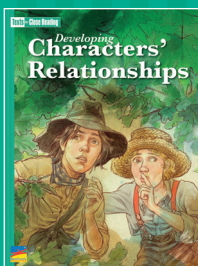
Word	My Definition	My Sentence
distribute (p. 22)		
myriads (p. 13)		
obliterated (p. 5)		
problematic (p. 26)		
pursuit (p. 19)		
receded (p. 18)		
scarce (p. 6)		
temporary (p. 7)		
tranquil (p. 12)		
vast (p. 18)		

Build Knowledge Across 10 Topic Strands

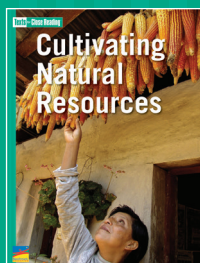
Government and Citizenship



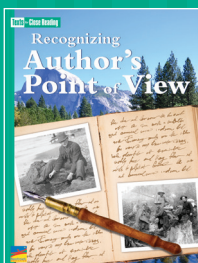
Character



Life Science



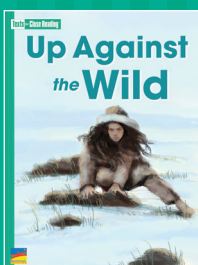
Point of View



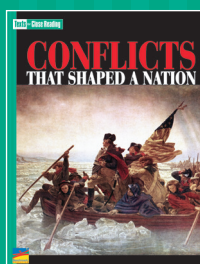
Technology and Society



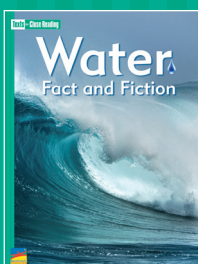
Theme



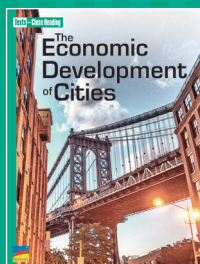
History and Culture



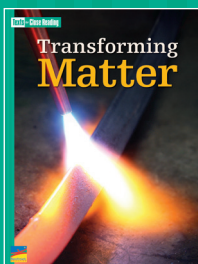
Earth Science



Economics



Physical Science



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