
RESEARCHING TO DEEPEN UNDERSTANDING

**DEVELOPING CORE PROFICIENCIES
ENGLISH LANGUAGE ARTS / LITERACY UNIT
GRADE 7**

**RESEARCH TOPIC REPOSITORY
WATER**

PURPOSES AND USES OF A RESEARCH TOPIC REPOSITORY

A Research Topic Repository provides a starting point and a set of common source texts in a given topical arena for student inquiry while developing the research proficiencies that are the instructional focus of the Research for Deepening Understanding Units. The Repository suggests issues to consider in narrowing and focusing a class or student research, provides examples of possible areas of investigation that might be pursued, lists broad inquiry questions that can lead to investigative paths, and includes a set of source texts for one possible area.

The common text set models a range of text types, perspectives, and provides both background and extension texts. Background texts should be accessible to the student (relatively straightforward in approach, syntax, and language), require little background knowledge to interpret, and be comprehensible, given the student's reading skill and level. Extension texts should be rich, complex, and challenging (at the upper end of the text complexity band). They should be characteristic of texts in the field being investigated, present sophisticated arguments and/or research studies, and demand that students read closely to unpack vocabulary, syntax, and meaning.

The Repository supports and informs teacher and student decisions that are made during the research process, as described in the Researching for Deeper Understanding unit plan. The first decision is which Repository to use as a context for the unit and student research, or whether to develop a new, parallel Repository. Teachers and students should base this decision on the instructional level, curriculum context, student interests, and common text levels.

The Lexiles of the model common sources contained in this repository range from 830L to 1180L

I. INTRODUCTORY TOPIC DESCRIPTION

WATER

Water is everywhere. We most often see it in oceans, lakes, rivers, and *precipitation* (e.g. rain and snow). It can also be found in deserts, underground, in the air, and in your body. Scientists have even found it in space. What is water? Water is a *molecule* or combination of the elements hydrogen and oxygen. The *chemical formula* for water is H₂O. People come in contact with many water molecules stuck together in one of three states: solid (ice), liquid (a pond), and gas (steam from a shower).

Maybe the most incredible thing about water is that there is always the same amount of water, just in different forms and in different places. Water moves around the Earth and atmosphere using the *water cycle*. Water is always changing states between ice, liquid, and gas.

As water moves through the water cycle and between its different states, it takes up space and *interacts* with both the living and nonliving world. It creates clouds and falls from the sky. It moves in the ocean making waves that splash on sand and rocks. It flows in underground rivers and rests in dark caverns beneath our feet. It floods fields of rice. And perhaps most importantly it fills cells in plants and animals allowing us to live and breathe.

The movement and interaction of water with the nonliving world creates big holes in the Earth like the Grand Canyon, makes the rough edges of a pebble smooth, and produces large storms. Imagine you are a water molecule in a glacier on the top of a mountain. The sun's rays melt the bonds between you and your molecular friends and everyone changes state from a solid to a liquid. You begin to flow down the mountain in a cold stream. As you flow you move through and around rocks and other obstacles creating channels, waterfalls, and sharp turns. You join other water molecules from other streams getting bigger and wider. Now you have enough energy to make gullies and to move stones or as you flow around them, creating bends and river banks. You are now with billions of other molecules in a massive river, slowing down and spreading out on flat plains and emptying into an ocean. From the mountain to the valley you have broken and moved rocks, carved the land, and have interacted with living things along the way.

The flow, drip, collection and *absorption* of water on and into the land acts as a stage for life as it begins with and is *sustained* by H₂O. For the living world, water is the basic building block of life. Think of a pond, full of plants and animals. How did the pond get there? A depression or hole was created in the ground by flowing water. Water filled up the hole and begins to soak the nearby dirt. Plants begin to grow in the water and around the pond in wet spots (*wetlands*). The plants continue to grow as long as water is around. Animals, like fish or frogs that depend on the plants for food make their home. Other animals that eat the birds and frogs, like raccoons or birds are attracted to this place. A *food web* is created all because water shaped the ground and created the right place for this life to begin. The pond and the life that it supports together are called an *ecosystem* (the interaction between living and nonliving). On a sunny weekend morning a family comes to the pond to have a picnic and fish. It is their favorite spot. Water is important to this family in other ways as well.

I. INTRODUCTORY

TOPIC DESCRIPTION (CONT'D)

People use water in many ways. Turn the handle on the tap in your kitchen or bathroom and water flows freely. It wasn't always so easy. Our ancestors around the world made the first homes near water because they knew their greatest chance for survival came with the life that water supported. It supported their lives. First they hunted and gathered animals and plants, but as they became more settled and created larger families, learned more about plants, and responded to changes in weather they began to farm. Growing plants requires water. This need for water began our long tradition of shaping the earth, creating machines, and making decisions all based on getting, moving, and using water.

Just like our ancestors we live near water, move water based upon our needs, and react to water as *weather patterns* change. These actions have serious impacts on us, our neighbors, our country and the world. There are more people now than ever before, which means there is more demand and dependency on water. Not just for drinking, but also for other things like recreation (e.g. fishing, boating, and vacation), transporting goods and materials (the Mississippi River), and agriculture (irrigation). Water also has spiritual and cultural meaning to us. There are places near water that define what home means for a community. Water is used in religious rituals, carrying important meaning for salvation and the afterlife.

Regardless of who we are or where we are from, we are connected to water. Our relationship with water and decisions about water are too important to ignore. Informed decisions result in *sustainable* use of water, like the Great Lakes Compact – an agreement between the states and Canadian provinces that surround the Great Lakes intended to ensure sustainable and collective decisions about how we use the water in these lakes. Selfish and uninformed decisions result in catastrophe such as the overuse of water in the Colorado River – it now runs dry 50 miles north of the Gulf of California. Whether we depend on water for drinking, washing, creating power, transporting, religious significance, food, or just to sit and watch we are all connected to water. However, it is important to remember that we need water. Water does not need us. We are responsible for being *sustainable stewards* of this resource.



II. POSSIBLE AREAS OF INVESTIGATION

1. Water and Urban Development (e.g., cities founded near water)
2. Water's Role in Sustaining Life (e.g., water cycle)
3. People's Interaction with Water (e.g., boating, showering, swimming, around the house)
4. The Effects of Water on the Environment (e.g., changing the physical landscape ie rivers, streams, mountains, valleys, canyons)
5. The Use of Water for Power (e.g., dams for hydroelectric power, water in nuclear power plants)
6. Early Explorers' Use of Water (e.g., Lewis and Clarke, Magellan, Columbus)
7. The Commerce of Water (e.g., shipping of goods overseas and from coast- to-coast, fishing, bottling water)
8. Problems Associated with Water (e.g., pollution, polar ice caps melting, running out of water)
9. Investigation of Career Options working with Water (e.g., marine biology, government)
10. Weather and Water (e.g., water affects major storms worldwide: hurricanes, typhoons, hail)



III. POSSIBLE GUIDING QUESTIONS FOR INQUIRY AND RESEARCH

The following questions can be used to initiate inquiry and to guide students in identifying paths for investigation.

1. What role has water played in the history of urban development? How has water affected the shaping of political maps?
2. How has water been used in times of war? What benefits does it provide to both aggressors and those on the defense?
3. How is water essential for sustaining life? In what ways is the worldwide water supply in danger?
4. In what ways do humans interact with water? How can water be used for recreation? Around the home?
5. How does water affect the physical features of the earth? Which physical features have been impacted most severely by water? What features will continue to be impacted in the future?
6. In what ways does water affect our weather cycle?
7. What problems are related to water? Melting polar ice caps, rising seas, pollution, drought, flooding, natural disasters?
8. How does water benefit worldwide commerce?
9. What is the value of water? What would a country do to guarantee unlimited access to water?
10. What career options and opportunities are there working with water?

IV. SOURCE LOCATIONS

In conducting research, students should be encouraged to conduct searches for sources in a variety of areas such as the school library, visits to and observations of sites and places related to the topic, search engines like Google and Bing, and on-line databases like EBSCO Host and Gale. In expanding the circle of potential resources for research, and in realigning their strategic searches, students should utilize the expertise of library-media specialists in their school or community, and learn from them how to access additional search vehicles that may be available to them.

Many state and school district library systems provide free public access to research portals that allow teachers and students to access various informational databases. Many of these have been organized so that articles can be searched for by text difficulty level (Lexile measure) as well as topic, allowing both teachers and students to find information at a variety of text complexity levels. Some national content aggregators that provide searches by Lexile level are: EBSCO, Gale, Grolier Online, Net Trekker, News Bank, Pro Quest, and Questia. Contact a library-media specialist for information on how to connect students to and navigate the state's database access.

V. COMMON SOURCE TEXT SET

The common text set for this Repository presents a model text sequence focused on a particular area of investigation; the common text set can be used in various ways by a teacher and students, depending on the degree to which they want to focus inquiry and research on the areas of investigation suggested by the texts in the set. Each common text is linked to a specific reading activity in the unit plan, and each includes a short set of text notes and a set of text-based questions to initiate students' close reading. The model sources in this repository can be used in a variety of ways including:

1. **Provide background and direction for inquiry focused on the area of investigation:** In this case, students will read and analyze the common texts either as main sources or as a research base as they embark on inquiry and investigation directly related to the area(s) of investigation presented in the texts. They will develop the close reading skills required for effective research through text-based discussions and analysis of the common texts, as explained in the unit plan. Students may then extend their individual research into closely related areas and new texts.
2. **Provide skills practice and a starting point for students' research:** In this case, students will work with the text set to learn about and practice the close reading skills required for effective research, but will then conduct research into a related, but new area of investigation identified by the teacher or students, applying those same skills with new texts.
3. **Serve as models for the teacher:** In this case, the teacher may identify other, similar texts in a chosen area of investigation and build a new or expanded common text set, which parallels the model set in terms of breadth, richness, and complexity. Students will develop the close reading skills required for effective research using the teacher's new common text set and will launch either teacher- or student-directed inquiry in a new area of investigation area suggested by the texts in the set.



V. COMMON SOURCE TEXT SET (CONT'D)

The general text characteristics and their *sequential use in the unit's activities* are outlined below:

Text #1 - Stimulus:

Rich, high interest text that can stimulate student thinking and discussion in the general topic area and lead the class or a student to consider various areas of investigation. Might be a literary text.

*Students will use this text as a jumping off point for inquiry in **Part 1, Activity 2.***

Text #2 - Background information:

Accessible informational text providing accurate background information on an identified area. Characteristics – rich, quality, credibility, connection to the inquiry. Should be a quality source of rich information on central aspects of topic. Should frame an area in a way that can lead to many paths of exploration, rather than a single perspective or focus.

*Students will use this text to build background and practice skills of close reading and initial text analysis (for credibility, accessibility, and relevance) in **Part 1, Activity 3, and Part 2, Activities 2-3.***

Text #3 - Background information:

Accessible informational text providing additional and complementary accurate background information related to an identified area of investigation.

*Students will use this text to build background and practice skills of close reading and initial text analysis (for credibility, accessibility, and relevance) in **Part 1, Activity 3, and Part 2 Activities 2-3.***

Text #4 - Perspective on the Topic:

Short, but potentially more challenging informational text that presents or suggests a particular perspective on an identified area of investigation. Should come from a credible source.

*Students will use this text to identify one of multiple ways of viewing the identified area of investigation, to practice close reading skills of analyzing perspective and bias, and to compare with other perspectives in **Part 2, Activities 2-3.***



V. COMMON SOURCE TEXT SET (CONT'D)

Text #5 - Perspective on the Topic:

Short, but more challenging informational text that presents or suggests a second or contrasting perspective on an identified area of investigation. Might come from a less known source with uncertain credibility.

*Students will use this text to identify one of multiple ways of viewing the identified area of investigation, to practice close reading skills of analyzing perspective and bias, and to compare with other perspectives in **Part 2, Activities 2-3.***

Text #6 - Perspective on the Topic:

Short informational text related to an identified area of investigation that presents or suggests an additional or contrasting perspective. Might come from an unusual source with uncertain credibility.

*Students will use this text to identify one of multiple ways of viewing the identified area of investigation, to practice close reading skills of analyzing perspective and bias, and to compare with other perspectives in **Part 2, Activity 2-3.***

Texts #7 - #10 - Arguments and Perspectives related to the Topic:

Longer and more complex informational texts related to an identified area of investigation with rich content, a clear perspective, and effective, well-developed argumentation.

*Students will use this text to deepen their understanding of the identified area of investigation and the issues, debates, and controversies that surround it, and to practice the close reading skills of analyzing arguments, their reasoning, and their supporting evidence in **Part 3, Activity2.***

NOTE: the teacher or students may supplement this text set with additional examples of academic writing from fields related to the area of investigation.



VI. COMMON TEXTS

WATER: IS THERE ENOUGH WATER ON EARTH FOR EVERYONE?

Text Complexity Range: 830L to 1180L

AUTHOR	DATE	LEXILE
Text #1: Introductory Text and “Introduction to Water” Video		
Zachary Odell/Frank Gregorio	2013/2009	980L
Text #2: How Much Water Is On Earth		
Jay Kimball	2012	830L
Text #3: Water Use Today		
United States Environmental Protection Agency	NA	1180L
Text #4: Many Well Users Find Their Faucets Are Running Dry		
David Mercer	August 14, 2012	1180L
Text #5: Water Footprint of An American		
NA	NA	NA
Text #6: Change The Course: Help Save The Colorado River		
Brian Clark Howard	February 13, 2013	NA
Text #7: A dwindling river: as water demands rise, the Colorado River is running dry		
Judith Cohen	October 8, 2007	1030L
Text #8: The Blue Planet Network		
NA	NA	NA
Text #9: Water: Protecting Clean Water For People and Nature		
NA	2013	1070L
Text #10: Is There Really A Water Crisis?		
Maggie Koerth Baker	November 9, 2012	1120L



TEXT #1

Introductory Text and "Introduction to Water" Video

By Zachary Odell/ Frank Gregorio

Date: 2013/2009 **Complexity Level:** 980L

TEXT NOTES

The introductory text to this repository has been written to be used in classrooms. It provides a textual overview of the importance of water and many of its qualities. This text can be used in concert with the "Introduction to Water" video from Frank Gregorio's series of dynamic introductions to scientific topics. These two pieces should provide a jumping of point for a class discussion of Water and its many uses on Earth.

Sample Text-Dependent Questions (to drive initial close reading and discussion):

1. In what ways does water impact the Earth?
2. In what ways does water influence human and animal life?
3. What are some of water's basic qualities?
4. What textual details from video and text would you like to explore further?



TEXT #2

How Much Water Is On Earth?

By Jay Kimball

Date: 2012 / **Complexity Level:** Measures at 830L

TEXT NOTES

This article uses an easy to understand analogy to help readers contemplate how much water exists on the earth. The relatively low lexile level makes this text accessible for most readers and is a good introductory text for students to begin to grasp the amount of water present on the earth and appreciate the total size of the Earth. The graphic depicted at the beginning of the article also illustrates Kimball's main point and can also be used to aid comprehension.

Sample Text-Dependent Questions (to drive initial close reading and discussion):

1. What do the two pictures help Kimball imply about the supply of water on the Earth?
2. When considering 70% of the globe is covered in water, which line from the text helps readers understand the overall size of the Earth?



TEXT #3

Water Use Today

United States Environmental Protection Agency

Date: NA

Complexity Level: Measures at 1180L

TEXT NOTES

This website has six pages of information related to water that students could access. For this repository we will just focus on the first page “Water Use Today.” This text helps shed light on the immense amount of water that each person in the United States uses each day. While many believe the water footprint is merely the amount of water that flows out a their sink, shower, and other faucets, there are hundreds of gallons of water a day used to make all of the items people purchase including: food, clothing, furniture, etc. This article explains the average American uses 300 gallons a day and breaks out the ways in which Americans consume this much water. The second half of the article details different industries in the United States and how much water they are responsible for withdrawing.

Sample Text-Dependent Questions (to drive initial close reading and discussion):

1. What is the author implying when writing, “Sometimes it’s easy to forget that we also use water in ways we don’t see every day?”
2. The domestic or household withdrawal of water is listed as 8.5% on the total U.S. Freshwater Withdrawals pie chart. Coupling this fact with which other detail from the story helps readers understand the immense amount of water the earth contains?



TEXT #4

Many Well Users Find Their Faucets Are Running Dry

By David Mercer

Date: August 14, 2012

Complexity Level: Measures at 1180L

TEXT NOTES

This newspaper article presents students with a straightforward account of how people are affected by drought and how many make decisions on water consumption while never fathoming that their water could run out. Because of its low complexity level this could be an introductory text to examining a subtopic around the decisions that people make concerning their access to water and how those decisions affect their ability to continue day-to-day household and business operations.

Sample Text-Dependent Questions (to drive initial close reading and discussion):

1. Mercer states several causes of people running out of water, both problems with infrastructure and individual decisions about usage. In what ways does he describe these problems and decisions? How do these descriptions help readers infer his beliefs about the problem and what might be some solutions?
2. Mercer interviews several people impacted by the drought in the Midwest. Many farmers and business owners are described as having to pay for water to be delivered to restock their wells in order to keep their businesses open. Mary Larkin said having water is “just something you take for granted.” How does Mercer use these to exemplify the problem of drought?



TEXT #5

Water Footprint of An American

The Nature Conservancy

Date: 2011 / Complexity Level: NA

TEXT NOTES

This visual explains to readers exactly how much water the average American uses in one day, including water that is “hidden” and used to grow and make the food we eat, clothes we wear, and produce the energy we consume. This text also provides numerous links to other pages that provide additional details on hidden water, tracking down your own water usage and footprint, and ways that you can get involved in protecting our world’s water.

Sample Text-Dependent Questions (to drive initial close reading and discussion):

1. The text states that, “On average, the ‘water footprint’ of an American is 32, 911 glasses of water a day...” How is this statistic explained in the text, noting that humans do not really drink this amount of water each day?
2. What relationship is explained between water levels dropping below a critical level and how animals and humans are affected?



TEXT #6

Change The Course: Help Save The Colorado River

By Brian Clark Howard

Date: February 13, 2013 / Complexity Level: NA

TEXT NOTES

This video works well with the text #7 because while text #7 describes the impact drought is having on the Colorado River Basin, this video introduces the idea that humans have much to do with the Colorado River going dry.

Sample Text-Dependent Questions (to drive initial close reading and discussion):

1. What evidence supports the conclusion that the Colorado River is in need of being saved?
2. The creators of the video are asking people to take a pledge to “Change the Course” of the Colorado River. What “course” are they referring to in the video?



TEXT #7

A dwindling river: as water demands rise, the Colorado River is running dry.

By Judith Cohen

Date: October 8, 2007 / **Complexity Level:** Measures at 1030L
(This source can be found by using the Gale Virtual Reference Library)

TEXT NOTES

This text details the ways in which the Colorado River is being depleted of water every day. The author's description of the geographic location of the Colorado River being near the desert southwest helps readers explore why this river is being threatened. The visuals including pictures and charts, help summarize key pieces of information that help make this piece accessible for students in middle school.

Sample Text-Dependent Questions (to drive initial close reading and discussion):

1. Which details in the text support Eleanor Sterling's claim in the first paragraph that, "Ensuring that everyone has enough fresh water will be one of the major issues facing us this century?"
2. What is the impact on the Southwestern United States due to freshwater sources being "spread extremely unevenly around the globe?"



TEXT #8

The Blue Planet Network Why Water?

Date: NA / **Complexity Level:** 1230L

TEXT NOTES

This website helps students discover why clean water is so vital for survival and uncovers the staggering number of people worldwide who do not have access to clean water. Teachers could begin by showing or directing students to the embedded video. Students interested in this topic may choose to review other suggested sites located at <http://blueplanetnetwork.org/about/water-resources>

Sample Text-Dependent Questions (to drive initial close reading and discussion):

1. In what ways are women and children directly impacted in areas of the world where there is a lack of clean water? Because of this impact, how are women and children further subjected poverty?
2. What evidence is provided to support the claim that "creating access to safe drinking water is achievable?"



TEXT #9

Protecting Clean Water For People and Nature

Date: 2013 / **Complexity Level:** Measures at 1070L

TEXT NOTES

This text presents students with one approach to preserving the world's lakes and rivers. This text is accessible to students and provides numerous links to additional research and efforts being made to address the water "issue". Students may access any of the links on the main page including the "Signature Programs" which provide more specified information on the individual programs.

Sample Text-Dependent Questions (to drive initial close reading and discussion):

1. The text states, "Forests, grasslands, and wetlands are nature's water filters. They help keep erosion and pollution from flowing in to our waters and they slow rainwater down, sending more water into underground supplies." What does this imply is a part of the solution to a creating a sustainable water supply for the future?
2. Which statistic presented in the text supports the emphasis the Nature Conservancy places on helping farmers find new approaches to irrigating their crops?



TEXT #10

Is There Really A Water Crisis?

By Maggie Koerth Baker

Date: November 9, 2012 / **Complexity Level:** Measures at 1120L

TEXT NOTES

This text presents an argument that there isn't actually a water scarcity problem but rather a water management issue. This text provides an interesting idea for more specific subtopic for students to pursue: what technologies exist to help communities reuse wastewater? How efficient and obtainable are these technologies for localities worldwide?

Sample Text-Dependent Questions (to drive initial close reading and discussion):

1. What specific evidence does Biswas include to support his belief that the real water problem is one of infrastructure and management, not of supply?
2. Which quotations from Biswas might provide interesting subtopics for researching?

VII. ADDITIONAL RESOURCES RELATED TO WATER

Background on amount of water

How Much Water Is On Earth, 1250L
Brett Israel
www.livescience.com

General Water use

Water Use in the US, 1290L
www.nationalatlas.gov

The Unfiltered Truth About Water
Evergreen AES

Case study (Colorado River Basin)

A Dire Shortage of Water, 760L
Emily Sohn

Possible Solutions

Desalinization, 1350L
Ben Sales

The Coming Water Wars
Princeton University Infographic