ELA Instructional Unit: The Science & Culture of Water (GLE 2 – 3.9)

Title	**The Science and Culture of Water**
GLE Range	**2 – 3.9**
Time	Approximately 20 hours
Purpose	Water is a part of every student's life. They interact with water in everyday tasks such as drinking a glass of water and in complex ways such as paying sewer taxes and tracking the weather. Water is something that is both taken for granted (doing the dishes after dinner) and in the forefront of the news (Flint, Michigan drinking water crisis). This unit will help students to build science content knowledge as they explore concepts related to water. It will also build social studies content knowledge as they look at water's role in the culture of different societies.
Essential Questions	What is water's role in everyday life? How does water shape a society and affect how people live?
Goals and Outcomes	Students will read and/or listen to print and online articles, watch videos, and engage in large and small group discussions about water - in the context of both science and social studies - in order to learn about the water cycle, fresh and salt water locations, water's effect on an environment, and the impact of water on different societies and cultures. Students will show their learning by choosing a society/culture, creating a visual (such as a poster, map, or diorama, for example) that shows the location of that society/culture and the water sources around it, and writing a simple, 2-3-level outline that tells about that society and water's impact on it. Students will use their outline to present their projects to the class, and display these products in the classroom.
Key Resources	Please see the resource list at the end of the unit, organized by the sequence of lessons.

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For the benefit of future users and curriculum developers, add these items as the unit is taught:

- Relevant assessment/evaluation forms
- Sample lesson plans
- Reflections and notes

Priority CCR Standards, all at Level B

R.1.B Read Closely to determine what the text says explicitly and to make logical inference from it; cite specific textual evidence when writing or speaking to support conclusion drawn from the text.

R.2.B Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.

RF.3.B Know and apply grade level phonics and word analysis skills in decoding words.

RF.4.B Read with sufficient accuracy and fluency to support comprehension.

W.4.B Produce clear and coherent writing in which the development, organization and style are appropriate to task, purpose, and audience.

W.8.B Gather relevant information from experiences or gather information from print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.

S&L.2.B Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively and orally.

S&L.4.B Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.

L.2.B Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

L.3.B Apply knowledge of language to understand how language functions in different contexts, to make effective choices for meaning or style, and to comprehend more fully when reading or listening.

UNIT OBJECTIVES--by the end of this unit, students will be able to:

ELA *(correlated to the leveled priority standards)*

- Read and listen closely in order to gather information from a variety of print and digital sources.
- Take notes from both written and print materials.
- Understand the difference between an outline and an essay.
- Organize notes into outline form.
- Demonstrate understanding of the difference between language use in an outline versus language use in other types of writing.
- Give an oral presentation to the class using their outline as a guide.

CONTENT

- Give a basic definition of a water molecule and of the water cycle.
- Describe some differences between fresh and salt bodies of water.
- Use a variety of maps
- Demonstrate a basic understanding of the connection between
  - the Nile River and both ancient and modern Egyptian society.
  - the Arctic Ocean and the Inuit culture.
  - water and the society they have chosen for their independent project.

ASSESSMENT

authentic performance task(s) that demonstrate student learning and integration of the knowledge and skills taught through the objectives

Demonstration of Learning

By the end of this unit, students will show their learning by choosing a society/culture, creating a visual (such as a poster, map, or diorama, for example) that shows the location of that society/culture and the water sources around it, and-writing a simple, 2-3-level outline that tells about that society and water's impact on it. Students will use their outline to present their projects to the class and display these products in the classroom.

Evaluation of Learning

This final product will be evaluated by both the student and instructor using a rubric that will be created by the teacher, with input from the class, based on key features of all the Priority CCRSAE for the unit.

Other Evidence of Learning

- The instructor will make anecdotal notes of student participation in large and small group discussions.
- The instructor will consider student notes, informal written work such as informal responses to questions, end of class oral feedback, and exit tickets
- One on one conferencing
- The Instructor will make notes of student responses in Fluency and Alphabetics groups
- Students will reflect on their own learning through discussions with the instructor and through informal reflective writing assignments.

LEARNING PLAN-- Suggested Sequence

(Note: Phonics and Fluency lessons should be incorporated at the lesson plan level)

Key Vocabulary--content and academic words or phrases; additional vocabulary may be selected by teachers at the lesson plan level

atom	solid	property	culture
molecule	liquid gas	characteristic	society
chemistry	water cycle	difference	science
chemical property	body of water	Similarity	outline
physical property	percentage	paraphrase	reflection
	geography	location	civilization

1. **Introduction to the unit**
   a. Watch a video with images of water, or google water images to look at together.
   b. General discussion about water – what do you know about it and what questions do you have?
   c. Read aloud and then discuss an excerpt from **A Long Walk to Water**.
   d. Write a short response – When you hear the word ***water***, what do you think of? Why is water so important? How do you use water in your everyday life?

2. **Water basics**
   a. Discuss what students know about water from previous science lessons and experiences.
   b. Introduce and define the word chemistry.
   c. Activity – 3 states of matter
   d. Read and discuss one or more informational pieces about water molecules and the physical and chemical characteristics of water.
   e. Use these articles to Introduce note taking. Review main idea, introduce paraphrase, model and set up guided practice on how to take notes.
   f. Watch a video on Properties of Water. Discuss and model taking notes from a video.

3. **Salt and fresh water**
   a. Read one or more informational articles about major fresh and salt bodies of water with guided and independent practice taking notes.
   b. Look at graphic information about how much water is on the earth, what percentages are salt and fresh water, and how much water is in the human body. Talk about gathering information and taking notes on graphic information.
   c. Guided and independent practice with gathering information from graphics.

4. **Where is water?**
   a. Use maps, charts or tables to help locate major oceans lakes and rivers. Work in groups to label this information on different maps.

5. **Water cycle**
   a. Read one or more informational articles and look at graphic information about the water cycle
   b. Conduct a basic Water Cycle experiment and record data.

6. **River culture** *(the sample lessons with this unit are for this section)*
   a. Explain that the procedure that follows will be used for the next part of the unit in order to prepare for individual presentations to come.
   b. Introduce the culture of Egypt and the Nile. Locate both the country and the river. Read

articles and watch videos in order to learn about the importance of the Nile to both the ancient Egyptians and current society.

c. Through each reading, model how to gather information and take notes.

d. Introduce outlines and how they can be used to organize information. Model taking the information that has been gathered about Egypt and putting it into an outline.

e. Introduce the oral piece of the project. Discuss what students think make for a good oral presentation. Model what a presentation of this topic could look like.

7. Ocean culture

a. Introduce the culture of the Inuit. Locate both the countries of the Inuit and the Oceans that influence them. Read articles and watch videos in order to learn about the importance of the ocean to both the ancient and current society.

b. Follow the same model as the river culture, except students will work together and individually through modeling and then guided practice to take notes and organize ideas into outline form.

c. Review oral presentations. Students will practice giving oral presentations about sections of this topic.

8. Independent project

a. The class will give input as to what should be included in the rubric for the final project.

b. Students choose a place that they are interested in learning about from a list of possible topics and will follow the model of the previous lessons to create their own presentation. They will create a visual (map or other visual) that shows the location of their chosen place and the water source that has the biggest impact on that society. They will read several articles, take notes, and organize those notes into an outline that will help them to present on their topic.

c. Students will each give an oral presentation, using the outline and visuals that they have created.

9. Reflection

a. Students will reflect on their own presentations, using the rubric to help evaluate their own work.

b. Students will discuss both in groups and individually with the instructor what they learned from the project. The class will also discuss where else in their lives they might use some of the skills (such as note taking or speaking in front of a group) that they practiced in this unit.

RESOURCES

1. Introduction to Water

Video:

- Images about water set to Music https://www.youtube.com/watch?v=nSENolWbyYQ

Text:

- **A Long Walk to Water** by Linda Sue Park – Each chapter of the book is divided into two separate stories. The top story is about Nya, a young girl from Sudan who must go and collect the water for her family. The first five chapters of her story could be used as a discussion prompt for the unit introduction. Students can discuss the differences between how Nya's family gets their water and our access to water in our everyday lives.
- Lesson Plans and readings that could be used in place of or as a supplement to **A Long Walk to Water** https://thewaterproject.org/resources/

2. Water Basics

Video:

- Basic water facts and facts about water consumption around the world https://www.youtube.com/watch?v=zNdbj3PbX6o
- Infographics about water and water consumption https://www.youtube.com/watch?v=PjSUg6JsLYw
- Video about the properties of water https://www.youtube.com/watch?v=DAilC0sjvy0

Print:

- Easy demonstrations for the three states of matter http://www.proteacher.org/c/935_States_of_Matter.html
- This site has a tab called 'water basics' with many follow up links https://water.usgs.gov/edu/
- Three sites for background info: http://www.ducksters.com/science/, http://www.chem4kids.com/files/matter_intro.html , http://www.chem4kids.com/files/atom_intro.html
- GLE 2 info article about 3 states of water https://www.readworks.org/article/Water-Takes-Three-Forms/bd2f6e6a-06c6-4273-8692-094ee2e5273e#!articleTab:content/
- GLE grade 3 information article about protecting water https://www.readworks.org/article/Whats-the-Big-Idea-about-Water-Waters-Impact-on-the-Earth/73934514-d3b3-4c11-8e8e-ce9d86fbcecb#!articleTab:content/

3. Salt and Fresh Water

Video:

- **Eggs Floating in Water – Science Experiments for Kids** - First two minutes demonstrate the experiment. https://www.youtube.com/watch?v=ggNI76hF6HQ

Print:

- GLE 2 article about fresh and saltwater https://www.readworks.org/article/Oceans-Rivers-and-Lakes/4b87a9fc-4803-458f-ade5-1131f0b41aeb#!articleTab:content/

- Some water statistics available under the tabs for water use, the water cycle, and water basics https://water.usgs.gov/edu/
- GLE 4 article about desalination – could be used with scaffolding or as a read aloud https://newsela.com/articles/desalination-drought/id/6034/

4. Where Is Water?

Maps:

- Finding continents and oceans http://www.teachervision.fen.com/geography/printable/50230.html
- For maps: www.eduplace.com and www.enchantedlearning.com

5. Water Cycle

Video:

- National Science Foundation video about water and the water cycle https://www.youtube.com/watch?v=al-do-HGuIk
- Bill Nye the Science Guy on the water cycle https://www.youtube.com/watch?v=hehXEYkDq_Y

Experiments:

- Water cycle experiments https://thewaterproject.org/resources/the_water_cycle
- Background info and water cycle experiments http://thehappyhousewife.com/homeschool/learning-about-the-water-cycle-experiment/

Print:

- Water cycle info available for kids and adults; the adults tab contains graphic info as well as statistics https://water.usgs.gov/edu/
- GLE 3 article about the water cycle (580L) https://newsela.com/articles/lib-nasa-water-cycle/id/24070/
- GLE 2 article about the water cycle https://www.readworks.org/article/We-Need-Water!/f03a79df-45af-499f-a8de-8b099bbc2679#!articleTab:content/

6. River Culture

Maps:

- For a world map http://www.eduplace.com
- For a map of Egypt with the Nile River http://www.enchantedlearning.com/africa/egypt/label/

Video:

- Egypt–Gift of the Nile (video is 7:42 minutes long; it is only necessary to watch to 5:22) https://www.youtube.com/watch?v=ZNiNByxFAX8
- Some information about ancient Egypt (up to 2:21) https://www.youtube.com/watch?v=mjThxcqOkKs
- Some information about modern Egypt https://www.youtube.com/watch?v=oh7chyESBG4

7. Ocean Culture

Video:

- Short glimpse into Inuit hunting https://www.youtube.com/watch?v=Ric3wCElO4Y
- Short glimpse into modern day Inuit life (each of these short videos is less than 3 minutes long, but could be used as a discussion starter) https://www.youtube.com/watch?v=Btz4LNaxF4c
- Parts of this 55-minute video talk about the Inuit culture and concerns about climate change. https://www.youtube.com/watch?v=N5ooFU5HosU
- Inuit Tradition – Inuit man talks about traditions and seal hunting from the past and today (video shows the hunter cutting up and preparing the seal as the narrator talks about it. https://www.youtube.com/watch?v=V6_I5b6vmMQ

Print:

- GLE2 information article, *Climate Change and the Inuit Culture* https://newsela.com/articles/inuit-food/id/13914/
- GLE 3 article, *Native American Cultures: Alaska* https://newsela.com/articles/lib-native-americans-alaska/id/31479/

8. Independent Project

Sample GLE 3 articles for the following topics:

- **Southwest**: Climate change in the Southwest https://newsela.com/articles/govt-EPA-climate-southwest/id/28396/
- **Rainforest**: Saving the Amazon's water https://newsela.com/articles/amazonbasin-conservation/id/13875/
- **Hawaii**: Climate change in Hawaii and the US tropical Islands https://newsela.com/articles/govt-EPA-climate-hawaii-islands/id/28408/
- **Africa**: The drinking water crisis in South Africa https://newsela.com/articles/southafrica-drought/id/14630/

See also https://thewaterproject.org/resources/ for Lesson Plans and readings.