NGSS 5th Grade Hydrosphere Lessons - **Martinez**

Grade/ Grade Band: 5	**Topic:** Science / Writing	**A series of** _5-6__ **lessons**
Brief Lesson Description: Students will take an extended tour of Earth's hydrosphere while learning about Earth's spheres. Once students learn about the water cycle, and about fresh water available on our planet, they will discuss ways in which we can educate our own communities about how precious our water resources are.		
Performance Expectation(s): **1. Write opinion pieces on topics or texts, supporting a point of view with reasons and information. a. Introduce a topic or text clearly, state an opinion, and create an organizational structure in which ideas are logically grouped to support the writer's purpose. b. Provide logically ordered reasons that are supported by facts and details. c. Link opinion and reasons using words, phrases, and clauses (e.g., consequently, specifically). d. Provide a concluding statement or section related to the opinion presented.**		
Specific Learning Outcomes: Students will describe the amount of freshwater on Earth, and research ways in which we can better conserve or use our water resources in our community.		
Narrative / Background Information: Students are studying Earth's Systems in 5th grade. Additionally, we often discuss the effect of drought in our county and water shortages in areas of California.		
NGSS Standard: 5-ESS2-2. Describe and graph the amounts and percentages of water and fresh water in various reservoirs to provide evidence about the distribution of water on Earth		
Science & Engineering Practices: **Developing and Using Models Modeling in 3–5 builds on K–2 experiences and progresses to building and revising simple models and using models to represent events and design solutions. § Develop a model using an example to describe a scientific principle. (5-ESS2-1) Using Mathematics and Computational Thinking Mathematical and computational thinking in 3–5 builds on K–2 experiences and progresses to extending quantitative measurements to a variety of physical properties and using computation and mathematics to analyze data and compare alternative design solutions. § Describe and graph quantities such as area and volume to address scientific questions. (5-ESS2-2)**	**Disciplinary Core Ideas:** **ESS2.C: The Roles of Water in Earth's Surface Processes § Nearly all of Earth's available water is in the ocean. Most fresh water is in glaciers or underground; only a tiny fraction is in streams, lakes, wetlands, and the atmosphere. (5-ESS2-2)**	**Crosscutting Concepts:** **Scale, Proportion, and Quantity § Standard units are used to measure and describe physical quantities such as weight and volume. (5- ESS2-2) Systems and System Models § A system can be described in terms of its components and their interactions. (5-ESS2-1)**
Possible Preconceptions/Misconceptions: Students have a decent understanding of the amount of water on Earth, but little understanding of how little of that is usable fresh water.		

LESSON PLAN – 5-E Model

ENGAGE: Opening Activity – Access Prior Learning / Stimulate Interest / Generate Questions: 50 min.

Engage - Teacher will read the picture book (or play the video) One Well by Strauss. We will do a KWL poster on what we know about the water on Earth. Teacher will show NOAA's Top Five weird ocean phenomena and we will add to the KWL. Students will learn how to use NASA data hydrosphere page and Britannica School to research and explore their "Wonder" questions. Students will find an "Easter egg" or interesting fact they found on NASA Data to add to an Easter Egg poster. Preview the NASA Water cycle video

EXPLORE: Lesson Description – Materials Needed / Probing or Clarifying Questions: 50 min.

Explore - Students will complete a water cycle activity (page 13) where they will end with a labeled diagram of the water cycle in their notebooks. Next they will play the interactive activities on Project Wet and add details to the diagram.
We will create a cloud in a bag experiment so students can observe over time. Add to the KWL if there are more wonderings.

EXPLAIN: Concepts Explained and Vocabulary Defined: 60 min.

Explain - Teacher will guide class to color and label a diagram of all of the water on Earth using a poster created by abetterlesson.com on Earth's Spheres. We will use part of the Mystery Science lesson on the amount of fresh water on Earth to make a diagram, and then point back at our diagram and point out which sources of water on the poster are fresh water. If there is still time, students will visit the interactive site Fresh water

ELABORATE: Applications and Extensions: 2 or 3 - 30 minute research and jigsaw sessions

Elaborate - Students will take part in "Expert Groups" where they will jigsaw and research topics around Earth's water and prepare a short presentation or slideshow to present for the class. Topics will include: desalinization, aqueducts, aquaponics and hydroponics, agriculture water needs, groundwater, and water treatment. Resources drawn from Earth Echo, NASA, NOAA, Readworks and Scholastic Science.

EVALUATE: Formative Monitoring / Summative Assessment (Quiz / Project / Report): 60 minutes for creation of slides, 45 minutes for proofreading and Flipgrid share out,.

Evaluate - The class will begin by adding to the KWL chart from the engage lesson. We will also look back at the weather phenomena to see if any sense-making has occurred since the first viewing.
Students will each create a set of slides to (fictitiously) present to their local city council. The first two slides will be informative in nature so the audience understands the critical importance of water available on Earth. The following two or three slides will be about a solution they have studied or connected with based on expert groups. The final slide will be a "why" slide that will be opinion based on the (fictional) premise that they are competing against each other for prize

money awarded to the cause or project. Students will present slideshows either live or on Flipgrid depending on time. Teacher will score based on rubric attached to sides assigned through Google classroom
Elaborate Further / Reflect: Enrichment: This topic will continue as we go through the spheres lessons. Students will have better buy-in for the spheres because of attachment to our own water issues. The mathematical representations of the freshwater on Earth will be a poster in class that will be referenced as we teach fractions and decimals. NASA data will be something we check in on every time we have an important wonder.
