

Lesson Title: One Ocean

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Topic: Earth's ocean

Targeted Grade Level: 4th

Time Needed: 1-2 45 minute sessions

Subject Integration: Art, Science, Writing, Reading

Justification: Students will be using images of Earth from NASA and maps to explain why scientists say the Earth has one Ocean and not 7 separate ones. It is important for the study of the hydrosphere, atmosphere, and other components of Earth for students to understand that the Ocean is one body of water that is interconnected.

Standards:

Responding: MA:Re7.1.4.a. Identify, describe, and explain how messages are created by components in media artworks.

4-ESS2-2. Analyze and interpret data from maps to describe patterns of Earth's features.

CCSS.ELA-LITERACY.W.4.1

Write opinion pieces on topics or texts, supporting a point of view with reasons and information.

CCSS.ELA-LITERACY.W.4.1.B

Provide reasons that are supported by facts and details.

CCSS.ELA-LITERACY.RI.4.9

Integrate information from two texts on the same topic in order to write or speak about the subject knowledgeably.

CCSS.ELA-LITERACY.SL.4.1.A

Come to discussions prepared, having read or studied required material; explicitly draw on that preparation and other information known about the topic to explore ideas under discussion.

Measurable Student Learning Objectives: Students will be able to develop a logical argument as to why the Earth is considered to have one Ocean. Students will support their argument using facts and details from imagery, readings, and maps. Students writing will be assessed using the attached rubric.

Nature of STEM: My lesson addresses the nature of STEM because it utilizes various resources to engage students. We will start by showing a video taken by an astronaut showing how blue the Earth looks from space for students to see the expanse of the ocean. We can really get kids interested by using these technology resources. The video is very vivid and entrancing. We will also be using maps to study how the Earth has one Ocean and understand how all the water is connected. _

Engaging Context/Phenomena: We will be using the video Jeff's Earth to engage students. It is a video and collection of photographs taken by astronaut Jeff Williams. In the video he describes what it is like to view the Earth from space and take pictures of the Earth from this angle. Several of the images portray the ocean and how expansive it is. There really is a sense of more water than land when viewing these images and videos.

Data Integration: Students will be looking at data in two different ways regarding the amount of water on Earth. They will begin by reading the article "What percent of Earth is water?" from Phys.org. This article explains that 70% of the Earth is water and only 30% is land. Then they will look at a graph on the USGS website that shows the ratio of salt to fresh water and then breaks down the sources of fresh water on the planet. (see image at the end of lesson plan)

Differentiation of Instruction: I have two SE students with IEPs. They both struggle with writing so to differentiate; I will have them write on their Chromebooks using a voice to text option.

Real-life Connection: Students should not only take away that the Ocean is all connected and what happens in one part of the ocean affects the entirety of it.

Possible Misconceptions: Students may believe that there are 7 separate oceans and that they are their own bodies of water. Students may also not know how little fresh water, and available fresh water for that matter, there is on Earth.

Lesson Procedure: This is where you include each phase of the 5E. They should be extremely clear, well organized, and ready to be used by another educator. Be sure that each learning experience meets the guidelines for each "E". The template below will help you.

5E Model	5E Objectives
<p><u>Engage</u></p> <p>Introduce the lesson with an anchoring phenomenon. Facilitate student questions, discussion, etc. as appropriate. Learn about what students already know and want to know.</p>	<p>Procedure: Students will watching the video Jeff's Earth at https://www.youtube.com/watch?v=-nmNhKRzy4w</p> <p>Modifications Students will need to be able to view the Smartboard</p> <p>Standards Addressed Responding: MA:Re7.1.4.a. Identify, describe, and explain how messages are created by components in media artworks.</p> <p>Formative/Summative Assessments Teacher will lead a discussion about the images and commentary from the video. Students should discuss what the author's takeaway/message in the video. They should identify that the photographs help us understand the author's view point and experience in space.</p> <p>Resources Smartboard, computer, speaker system, YouTube</p>
<p><u>Explore</u></p> <p>Plan for students to engage in hands-on activities that are designed to facilitate conceptual change.</p>	<p>Procedure: The whole class will read two articles. What percent of Earth is water? and How many oceans are there?. Students will also analyze a Graph from the USGS (See below).</p> <p>Modifications Students may need to have articles read to them and explained while reading through them after the whole class read through has taken place.</p> <p>Standards Addressed CCSS.ELA-LITERACY.RI.4.9 Integrate information from two texts on the same topic in order to write or speak about the subject knowledgeably.</p> <p>Formative/Summative Assessments Ask explicit questions about the text and graphic features</p> <p>Resources a copy of each article for every student and the graph presented for the class on the</p>

	Smartboard
<p><u>Explain</u></p> <p>Facilitate opportunities for students to explain their understanding of concepts and processes and make sense of new concepts.</p>	<p>Procedure: Students will work in groups of 3 to analyze a map of the earth. They will begin by labeling the ocean (basins). Then they will need to decide where the boundaries for each of the basins lie on the map.</p> <p>Modifications Students may need to reference the class globe or have the ocean basins labeled for them.</p> <p>Standards Addressed 4-ESS2-2. Analyze and interpret data from maps to describe patterns of Earth’s features.</p> <p>Formative/Summative Assessments Are the basins labeled correctly. Did students struggle with labeling the oceans’ boundaries. They should determine at this point that all the oceans are connected and that there aren’t really any boundaries between the bodies of water.</p> <p>Resources One map per group, pen/pencil, access to globe if needed for labeling</p>
<p><u>Elaborate</u></p> <p>Provide applications of concepts and opportunities to challenge and deep ideas; build on or extend understanding and skills.</p>	<p>Procedure: Students will write an opinion paper, supported by facts, answering the question <i>why do you think scientists say there is one global ocean?</i></p> <p>Modifications Students with IEPs can use a voice to text feature in Google docs to write their paper.</p> <p>Standards Addressed CCSS.ELA-LITERACY.W.4.1</p> <p>Write opinion pieces on topics or texts, supporting a point of view with reasons and information.</p>

	<p>CCSS.ELA-LITERACY.W.4.1.B Provide reasons that are supported by facts and details.</p> <p>Formative/Summative Assessments -rubric (see below)</p> <p>Resources student notebook or Chromebook</p>
<p><u>Evaluate</u></p> <p>Assess students knowledge, skills and abilities.</p>	<p>Procedure: Students will share their thinking from their writing</p> <p>Modifications some students may need help formulating or verbalizing their opinion. Teacher should support them as necessary; i.e. provide leading questions “I think...because...”</p> <p>Standards Addressed CCSS.ELA-LITERACY.SL.4.1.A</p> <p>Come to discussions prepared, having read or studied required material; explicitly draw on that preparation and other information known about the topic to explore ideas under discussion.</p> <p>Formative/Summative Assessments Formative – are students using knowledge from map analysis and readings to support their views.</p> <p>Resources students may using their writing and/or articles as support when discussing their vews.</p>

Teacher Background: What background information does the teacher need to effectively teach this lesson? If you can provide links to resources, please do so.

The teacher should have background knowledge about the Earth having one interconnected global Ocean. She/He should also be cognizant of the quantity of water on Earth and general knowledge on the quantity of salt water versus fresh water. Below are some helpful resources:

https://www.usgs.gov/special-topic/water-science-school/science/where-earths-water?qt-science_center_objects=0#qt-science_center_objects

<https://oceanservice.noaa.gov/facts/howmanyoceans.html> (students will be reading this article as well)

<https://oceanservice.noaa.gov/facts/howmanyoceans.html> (this is a more indepth and detailed article, teacher should read before presenting to students.

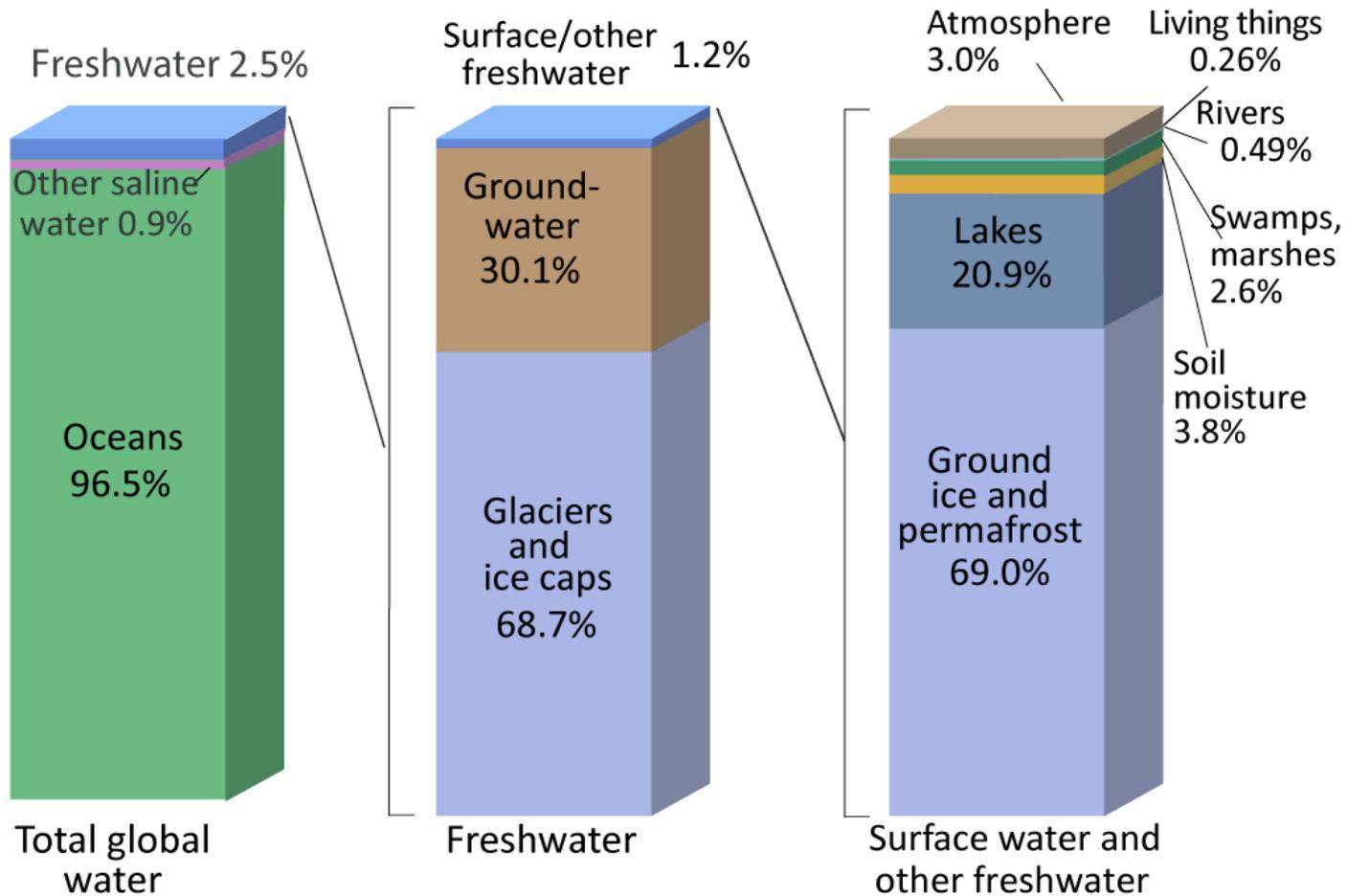
Rubric –

Rubric for Expository Writing - Opinion/Fact Paragraph

<i>Insert Point Value</i> →				
Opinion/Fact Style and Structure	The student shows a complete understanding of an opinion/fact paragraph.	The student shows understanding of an opinion/fact paragraph, but reader may need to infer.	The student shows little understanding of an opinion/fact paragraph.	The student is not showing understanding.
Informational	The student's writing is informational and opinions are supported with detail.	The student's writing is informational, has some opinions, but could use more detail to support it.	The student's writing has some information, too many opinions, and is lacking detail.	The student is not showing understanding of informational writing.
Vocabulary	The student shows use of topic specific vocabulary and defines it when needed for the reader.	The student uses topic specific vocabulary and attempts to define it when needed.	The student uses some topic specific vocabulary but does not define it.	The student is not showing understanding of topic specific vocabulary.
Sentence Fluency	The student shows a complete understanding of sentence fluency with no major stumbling points.	The student shows a good understanding of sentence fluency with only minor stumbling points.	The writing has multiple points where the reader stumbles over the sentences.	The student is not showing understanding.
Conventions	The student has only a few capitalization and punctuation mistakes.	Most conventions are correct with only minor mistakes.	Conventions are something that needs to be worked on - showing many errors.	The student is not showing an understanding of conventions.

COMMENTS:

Where is Earth's Water?



Source: Igor Shiklomanov's chapter "World fresh water resources" in Peter H. Gleick (editor), 1993, *Water in Crisis: A Guide to the World's Fresh Water Resources*. (Numbers are rounded).

References:

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