

# A World of Water

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## Science Grade 2

In this unit, the students will learn about the different bodies of water found on the earth's surface. The students will use resources to explain that water is found on earth in different areas. Students will compare and contrast the different bodies of water. At the end of the unit, they will be able to identify the characteristics of each body of water including size, salt or freshwater and liquid or solid.

**Please provide us some background information on the unit development.** In order to help others who are interested in this topic understand a bit more about what you created, we will write a short introduction to each unit and provide some images, in addition to posting the completed units on the Cape Cod Regional STEM Network website ([www.capecodstemnetwork.org](http://www.capecodstemnetwork.org)). Please help us by answering the questions below after you have completed your unit.

1. Who helped to create this unit?

Names	School (Grade/course taught)
Michael Irving	3rd Grade - North Falmouth Elementary School
Grace Simpkins	Marine Education Specialist, Woods Hole Sea Grant (WHOI)

2. What were some sources of inspiration for this unit?

Our main inspiration for this unit is the ongoing Covid-19 Global Pandemic. We felt it was important to create lessons for both in-class and remote learning. These lessons include hands-on and outdoor activities for students who may be working from home. The other inspiration for this unit is our relationship with and proximity to water. When you live on Cape Cod, much of what you do is affected by the water you're surrounded by on four sides.

3. In your own words, what are you hoping students learn—big picture—through this unit?

The students will understand the relationship between humans and water. They will understand that there is a great deal of water on our planet in many different forms. Water is needed for survival but also provides us with food, entertainment and ways to ship things from place to place.

4. What might students find exciting in this unit?

Much of the information they will learn will have real-world applications.

5. What science standards or real-world content did you strive to emphasize?

All living things need water to survive. If we don't take care of the water on the earth it affects all the other ecosystems and species on Earth.

6. How would you say that this unit "matters" to the STEM community? Or to our community on Cape Cod? Or to the larger community?

All aspects of STEM are critical in the study and care of our water supply and all the various bodies of water we use for various purposes. Our relationship with NOAA and WHOI show us how STEM is used everyday in the study of our oceans and other bodies of water.

7. What's the most important lesson you learned as you created this?

I learned that it will be very challenging to get the students to appreciate the amount of water on the earth compared to land. Even if we taught science every day we would still not be able to teach the students all about the bodies of water on Earth and what lives in the bodies of water.

8. Anything else you would like fellow teachers or others to know about this unit?

In this lesson we are focusing on oceans, freshwater lakes and ponds and rivers. There are many other bodies of water (seas, bays, marshes, creeks, etc.) that you may add to the discussion. We did not include them.

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## Stage 1 Desired Results

### MA STE Standards:

2-ESS2-2. Map the shapes and types of landforms and bodies of water in an area.

Clarification Statements:

- Examples of types of landforms can include hills, valleys, river banks, and dunes.
- Examples of water bodies can include streams, ponds, bays, and rivers.
- Quantitative scaling in models or contour mapping is not expected.

2-ESS2-3. Use examples obtained from informational sources to explain that water is found in the ocean, rivers and streams, lakes and ponds, and may be solid or liquid.

### MA History and Social Science Frameworks:

Topic 1. Reading and making maps [2.T1]

Topic 2. Geography and its effects on people [2.T2]

### Next Generation Science Standards:

2-ESS2-2 Develop a model to represent the shapes and kinds of land and bodies of water in an area.

2-ESS2-3 Obtain information to identify where water is found on Earth and that it can be solid or liquid.

### ESSENTIAL QUESTIONS

**Why is water important to the earth?**

**What forms of water make up the earth's surface?**

**What are the different bodies of water that make up the earth's surface?**

### UNDERSTANDINGS

**Students will understand that 75% of the earth is covered in either liquid or frozen water in many different forms.**

**Students will be skilled at identifying the different bodies of water that make up the earth's surface.**

### TRANSFER

**Students will be able to independently use their learning to identify bodies of water on a map or diagram. They will also be able to describe the differences between the bodies of water.**

**Ocean Literacy Principles:**

1. The Earth is one big ocean with many features

- a- The ocean is the defining physical feature on our planet Earth—covering approximately 70% of the planet’s surface. There is one ocean with many ocean basins, such as the North Pacific, South Pacific, North Atlantic, South Atlantic, Indian, Southern and Arctic.
- g - The ocean is connected to major lakes, watersheds and waterways because all major watersheds on Earth drain to the ocean. Rivers and streams transport nutrients, salts, sediments and pollutants from watersheds to estuaries and to the ocean.

**Cross-Curricular Connections:**

CCSS.ELA-LITERACY.RI.2.1

Ask and answer such questions as *who, what, where, when, why, and how* to demonstrate understanding of key details in a text.

CCSS.ELA-LITERACY.RI.2.4

Determine the meaning of words and phrases in a text relevant to a *grade 2 topic or subject area*.

CCSS.ELA-LITERACY.RI.2.5

*Know and use various text features (e.g., captions, bold print, subheadings, glossaries, indexes, electronic menus, icons) to locate key facts or information in a text efficiently.*

CCSS.ELA-LITERACY.RI.2.7

*Explain how specific images (e.g., a diagram showing how a machine works) contribute to and clarify a text.*

CCSS.ELA-LITERACY.W.2.2

Write informative/explanatory texts in which they introduce a topic, use facts and definitions to develop points, and provide a concluding statement or section.

## Stage 2 Evidence

### Formative Assessment Ideas:

Name and label the bodies of water in a given area.

Define the different bodies of water

Daily teacher observations

### Summative Assessment Ideas:

Projects

Hands-on activities

Teacher observations

## Stage 3 Key Learning

### Summary of Key Learning Events and Instruction

**Lesson 1: What is Water?** - Water is one of the most essential elements found on Earth. The students will learn how to classify the different bodies of water. They will learn about salt and freshwater. They will also learn about the different forms of water.

**Lesson 2: Oceans of the World** - This lesson will explore the largest body of water. Oceans cover nearly 75% of the Earth's surface. They have an impact on our daily lives that we may not even be aware of.

**Lesson 3: Lakes and Ponds** - Look around your neighborhood, you probably have a pond pretty close to you. Learn what makes a lake and a pond different from an ocean. Explore the inhabitants of freshwater lakes and ponds.

**Lesson 4: A River Runs Through It** - Explore the rapid world of rivers and streams in this lesson. Follow rivers from their source along their path as they weave through mountains and forests until they come to an end in another body of water.

<p><b>Introductory Lesson</b> Lesson that introduces the content. More teacher directed</p>	<p><b>Constructing Lesson</b> Lessons that engage students in building and linking together understanding. Guided/collaborative. Student/teacher or partners/small group</p>	<p><b>Practice Lesson</b> Lessons or activities that students can complete relatively independently</p>	<p><b>Assessment Lesson</b> Formative: Check-ins along the way to see if students “get it” Summative: Students showing what they know, when you feel they are ready</p>
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## Stage 3 Learning Plan

### Summary of Key Learning Events and Instruction

Lesson Name	Type (Introductory, Constructing, Practice, and Assessment)	Content Addressed	Standards Included (by number)
1. What is water?	Introductory, Constructing, Practice	Forms of water, the amount of water on earth, the different bodies of water. Saltwater and freshwater.	2-ESS2-2
2. Oceans of the World	Constructing, Practice	The names of the 5 main ocean basins. Definition and characteristics of oceans. The ocean ecosystem. How we use oceans	2-ESS2-2
3. Lakes and Ponds	Constructing, Practice	Definition and characteristics of lakes and ponds. The ecosystem found in and around ponds. How we use lakes and ponds.	2-ESS2-2



4. A River Runs Through It, Around It and Down It	Constructing, Practice	Definition and characteristics of rivers, streams and creeks. The ecosystems found in and around rivers, streams and creeks. How humans and animals use rivers, streams and creeks.	2-ESS2-2
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## Lesson 1: What is Water?

**Overview of the Lesson:** In this lesson, the students will use their prior knowledge to define water, explain the different forms, recognize the uses of water and name the different bodies of water. They will analyze maps to see how bodies of water are represented.

**Time (minutes): (45-60 minutes)**

**Standard(s):**

MA STE Standards: 2-ESS2-2

MA History and Social Science Frameworks: 2.T1 and 2.T2

Next Generation Science Standards: 2-ESS2-2 and 2-ESS2-3

Ocean Literacy Principles: 1-a, g

**Essential Question(s):**

- What is water?
- Why is water essential to Earth’s inhabitants?
- How is water used?
- What different forms does water take?
- What are the different bodies of water?

**Science Objectives:**

- The students will be able to define the terms for water in solid, liquid and gas form.
- The students will identify ice is the solid form of water, water is a liquid and steam is the gas form of water.
- The students give examples of how water is used.
- Students will be able to name the different bodies of water.
- Students will be able to characterize bodies of water by their attributes.

**Language Objectives and/or Targeted Academic Language:**

<b>water</b>	<b>ice</b>	<b>steam</b>	<b>hydrology</b>
<b>recreation</b>	<b>commerce</b>	<b>ocean</b>	<b>river</b>
<b>lake</b>	<b>pond</b>		

**Anticipated Student Preconceptions/Misconceptions (optional)**

**Instructional Materials/Resources/Tools:**

SmartBoard/Chart paper  
Colored pencils  
Computer/Internet  
Bodies of Water Worksheet

**Instructional Tips/Strategies/Suggestions for Teacher:** These lessons were developed to utilize the 39 NOAA Live! Recorded Webinar Videos. While certain video clips were pulled out to highlight concepts, you may want to look at the [whole playlist on YouTube](#) to see the additional resources available. If your class has a particular interest, you may find a more relevant webinar to highlight in the video section of the lesson.

If your students are not familiar with using the scroll bar at the bottom of a YouTube video to move to a specific timestamp you may want to review or practice with them first.

**Assessment:**

Students will be able to name the different bodies of water.  
Students will be able to correctly identify bodies of water on a map.  
Teacher observations

**Science and Engineering Practices included (put the included ones in bold):**

1. **Asking questions (for science) and defining problems (for engineering)**
2. **Developing and using models**
3. **Planning and carrying out investigations**
4. Analyzing and interpreting data
5. Using mathematics and computational thinking
6. Constructing explanations (for science) and designing solutions (for engineering)
7. Engaging in argument from evidence
8. **Obtaining, evaluating, and communicating information**

**Notes about Science and Engineering Practices included:**

**Lesson Overview:** In this lesson, the students will use their prior knowledge to define water, explain the different forms, recognize the uses of water and name the different bodies of water. They will analyze maps to see how bodies of water are represented.

**IN CLASS**

**VIRTUAL ALTERNATIVE**

**Opening/Engagement (10 mins):**

1. Ask the students to think about the following question, “What is water?” On a SmartBoard or chart paper, list some of the answers the students receive. Possible answers: a liquid, you drink it, you shower in it, you swim in it, it makes snow, etc
2. Lead that conversation to the question, “What form can water

**Independent Assignment: (10-15 minutes)**

1. Before the students meet with the teacher, have the students watch a grade appropriate video or two on Bodies of Water:

<https://www.youtube.com/watch?v=bNWuQD7QHbc>

<p>take?" Write the answers on the SmartBoard or chart paper. Students should be able to come up with liquid, snow, steam and ice.</p> <p>3. Ask the students if they can name places on the Earth that you can find water in all these <a href="#">different forms</a>.</p>	<p>2. On Google Classroom, have the students complete a short assignment related to the video.</p> <p>What are the 3 forms of water? How much of the Earth's surface is covered in water? Name 5 bodies of water:</p> <ol style="list-style-type: none"> <li>1.</li> <li>2.</li> <li>3.</li> <li>4.</li> <li>5.</li> </ol>
<p><b>IN CLASS</b></p>	<p><b>VIRTUAL ALTERNATIVE</b></p>
<p><b>During the Lesson (15-20 mins):</b></p> <ol style="list-style-type: none"> <li>1. Show a <a href="#">slide</a> or have prewritten the question: How much of the Earth's surface is covered by water? Your choices can be in percentage form or fraction form depending on the level of your students. Example: a. 20% b. 45% c. 75% d. 10% Based on your student's answers show a globe or a map so they can see the coverage.</li> <li>2. Ask one of the students who picked 75% why they chose that answer? Reveal to the students the correct answer is <a href="#">75%</a>. Tell the students that the water on the Earth is found in different bodies of water.</li> <li>3. Show the students a representation of 75%...show them a clear container with <math>\frac{1}{4}</math> cup of dirt and another container with <math>\frac{3}{4}</math> of water.</li> <li>4. Show the students a <a href="#">map</a> or a globe.</li> <li>5. Ask the students if they know any bodies of water. On the SmartBoard or chart paper, list their answer. They may give specific names or the general bodies of water. Lead the students if they don't get: oceans, lakes, ponds, rivers and streams. Depending on your location they may come up with bays, seas,</li> </ol>	<p><b>Meeting with Teacher (Zoom): (20-25 minutes)</b></p> <ol style="list-style-type: none"> <li>1. Ask the students to think about the following question, "What is Water?" On your screen or chart paper, list some of the answers the students receive. Possible answers: you drink it, you shower in it, you swim in it, it makes snow, etc</li> <li>2. Lead that conversation to the question, "What form can water take?" Write the answers on your screen or chart paper. Students should be able to come up with liquid, snow, steam and ice.</li> <li>3. Ask the students if they can name places on the Earth that you can find water in all these <a href="#">different forms</a>.</li> <li>4. Show a <a href="#">slide</a> or have prewritten the question: How much of the Earth's surface is covered by water? Your choices can be in percentage form or fraction form depending on the level of your students. Example: a. 20% b. 45% c. 75% d. 10% Based on your student's answers show a globe or a map so they can see the coverage.</li> <li>5. Ask one of the students who picked 75% why they chose that answer? Reveal to the students the correct answer is <a href="#">75%</a>. Tell the students that the water on the Earth is found in different bodies of water.</li> </ol>

<p>creeks, bogs, marshes, etc. Our focus is on oceans, lakes, ponds, rivers and streams.</p> <ol style="list-style-type: none"> <li>6. Ask the students if they can name any of these bodies of water that we live near? Possible answers: Atlantic Ocean, Cape Cod Bay, Long Pond, Mashpee River, John’s Pond, Lake Winnepesaukee.</li> <li>7. Project a <a href="#">map</a> of Massachusetts and Cape Cod showing the lakes and rivers.</li> </ol>	<ol style="list-style-type: none"> <li>6. Show the students a <a href="#">map</a> or a globe.</li> <li>7. Ask the students if they know any bodies of water. On your screen or chart paper, list their answer. They may give specific names or the general bodies of water. Lead the students if they don’t get: oceans, lakes, ponds, rivers and streams. Depending on your location they may come up with bays, seas, creeks, bogs, marshes, etc. Our focus is on oceans, lakes, ponds, rivers and streams.</li> <li>8. Ask the students if they can name any of these bodies of water that we live near? Possible answers: Atlantic Ocean, Cape Cod Bay, Long Pond, Mashpee River, John’s Pond, Lake Winnepesaukee.</li> <li>9. Project a <a href="#">map</a> of Massachusetts and Cape Cod showing the lakes and rivers.</li> </ol>
	<p><b>VIRTUAL ACTIVITY</b>  <b>Activity: <a href="#">Bodies of Water Worksheet</a> - Ask the students to use the worksheet and list under each name the characteristics that make each body of water different. Point out at the top of the page to think of: size, type of water, movement, inhabitants and ways humans or animals use water.</b></p>
<p><b>IN CLASS</b></p>	<p><b>VIRTUAL ALTERNATIVE</b></p>
<p><b>Lesson Closing (15 mins):</b>  <b>Activity: <a href="#">Bodies of Water Worksheet</a> - Ask the students to use the worksheet and list under each name the characteristics that make each body of water different. Point out at the top of the page to think of: size, type of water, movement, inhabitants and ways humans or animals use water.</b></p> <p><b>Finish the lesson by showing the following video:</b>  <a href="https://www.youtube.com/watch?v=bNWuQD7QHbc">https://www.youtube.com/watch?v=bNWuQD7QHbc</a></p>	<p><b>Lesson Closing (Zoom): (10-15 minutes)</b></p> <ol style="list-style-type: none"> <li>1. Check in with students.</li> <li>2. Have the students show their Bodies of Water Worksheets.</li> </ol>

	<p><b>EXPLORE OUTDOORS:</b> Find the nearest body of water to your house. It may be a stream or a pond. Draw a picture of the body of water. Note the plants and animals around the body of water.</p>

## Lesson 2: All About Oceans

**Overview of the Lesson:** In this lesson, the students will learn the characteristics of an ocean. The students will learn just how much oceans cover the Earth. They will learn how scientists study the oceans of the world to make sure they stay healthy.

**Time (minutes): (40-60 minutes)**

**Standard(s):**

MA STE Standards: 2-ESS2-2

MA History and Social Science Frameworks: 2.T1 and 2.T2

Next Generation Science Standards: 2-ESS2-2 and 2-ESS2-3

Ocean Literacy Principles: 1-a, g

**Essential Question(s):**

- What are the characteristics of an ocean?
- How many main ocean basins are there on Earth?
- What are the names of the Earth's ocean basins?
- Why haven't all the Earth's oceans been explored?

**Science Objectives:**

- Students will understand that oceans are the largest bodies of water.
- Students will be able to explain that oceans are salt water.
- Students will be able to explain how the oceans are always moving
- Students will memorize the names of the 5 oceans that make up the earth's oceans.

**Language Objectives and/or Targeted Academic Language**

<b>salt</b>	<b>tides</b>	<b>currents</b>	<b>waves</b>
<b>Pacific</b>	<b>Atlantic</b>	<b>Southern</b>	<b>Arctic</b>
<b>Indian</b>	<b>seas</b>	<b>bays</b>	<b>sea life</b>
<b>basin</b>			

**Anticipated Student Preconceptions/Misconceptions (optional):** While there is only one global ocean, the vast body of water that covers 71 percent of the Earth is geographically divided into distinct regions. Most countries, including the US, now recognize five named ocean basins: the Southern (Antarctic), Pacific, Atlantic, Indian, and Arctic ([National Ocean Service](#)). For the purpose of this lesson, we will refer to the commonly named ocean basins as “oceans”.

**Instructional Materials/Resources/Tools:**

SmartBoard/Chart Paper  
 Computer/Internet  
 Oceans of the World  
 NOAA Live! Webinars  
 Online or Physical Map of the World  
 Your the Captain Worksheet

**Instructional Tips/Strategies/Suggestions for Teacher:** These lessons were developed to utilize the 39 NOAA Live! Recorded Webinar Videos. While certain video clips were pulled out to highlight concepts, you may want to look at the [whole playlist on YouTube](#) to see the additional resources available. If your class has a particular interest, you may find a more relevant webinar to highlight in the video section of the lesson.

**Assessment:**  
Completion of activities  
Teacher observations

**Science and Engineering Practices included (put the included ones in bold):**

1. **Asking questions (for science) and defining problems (for engineering)**
2. **Developing and using models**
3. **Planning and carrying out investigations**
4. Analyzing and interpreting data
5. Using mathematics and computational thinking
6. Constructing explanations (for science) and designing solutions (for engineering)
7. Engaging in argument from evidence
8. **Obtaining, evaluating, and communicating information**

**Notes about Science and Engineering Practices included:**

**Lesson Overview:** In this lesson, the students will learn the characteristics of an ocean. The students will learn just how much oceans cover the Earth. They will learn how scientists study the oceans of the world.

**IN CLASS**

**VIRTUAL ALTERNATIVE**

**Opening/Engagement: (10 minutes)**

1. Ask the question, "Does anyone know how many oceans there are on Earth?" Write the answers on a SmartBoard or chart paper. Tell them you will tell them the correct answer in a minute.

**Independent Assignment: (10-15 minutes)**

1. Before the students meet with the teacher, have the students watch a grade appropriate video or two on Oceans:  
<https://www.youtube.com/watch?v=4sj0oLmKG9Q>



<ol style="list-style-type: none"> <li>2. Ask, “What are the names of the oceans?” Again, write the answers on the SmartBoard or chart paper. If they don’t get all 5, project a map of the <a href="#">Earth</a> to help them finish the list.</li> <li>3. Watch this video on ocean facts: <a href="https://www.youtube.com/watch?v=4sj0oLmKG9Q">https://www.youtube.com/watch?v=4sj0oLmKG9Q</a></li> <li>4. Remind them that in the last lesson they listed the characteristics of an ocean on their <a href="#">Bodies of Water Worksheet</a>. Without their worksheet, ask them to recall what they remember. Possible answers: saltwater, moves with the tides, has currents, largest body of water, names of inhabitants, etc.</li> </ol>	<p>2. On Google Classroom, have the students complete a short assignment related to the video.</p> <p>Name the 5 oceans:</p> <ol style="list-style-type: none"> <li>1.</li> <li>2.</li> <li>3.</li> <li>4.</li> <li>5.</li> </ol> <p>List 5 characteristics of an ocean:</p>
<p><b>IN CLASS</b></p>	<p><b>VIRTUAL ALTERNATIVE</b></p>
<p><b>During the Lesson: (20-25 minutes)</b></p> <ol style="list-style-type: none"> <li>1. Ask the question: How do we know what we know about oceans? Possible answers: scientists, explorers, ROVs, etc.</li> <li>2. Explain to the students that the oceans are so large, there are parts that haven’t been explored, and we use the oceans (or one big ocean) to get from continent to continent.</li> <li>3. Clips 1 and 2 represent how scientists explore the ocean and Clip 3 represents how we use the ocean to transport goods around the world.</li> <li>4. Teacher Note: Choose which set of clips you would like to show. Have the students write down at least <a href="#">5 important facts</a> they learned from the video clips: Clip 1 - Webinar 3 - <a href="#">The Ocean From Space</a> - Satellites- 2:29-5:25, Plants- 7:49-12:07, Satellite Data-14:50-19:34, Salinity- 19:50-24:52, Sea Ice- 27:05-32-38 Clip 2 - Webinar 4 - <a href="#">Onward and Downward! Exploring the Deep Ocean</a> - Mapping- 12:25-17:51, Mapping Activity- 22:07-25:04, Before Sonar- 29:41-32:47, Deep Water- 35:46-42:13 Clip 3 - Webinar 21 - <a href="#">Helping Big Ships Bring Goods into Port So You</a></li> </ol>	<p><b>Meet with the Teacher (Zoom): (15-20 minutes)</b></p> <ol style="list-style-type: none"> <li>1. Ask the question, “Does anyone know how many oceans there are on Earth?” Write the answers on your screen or chart paper. Tell them you will tell them the correct answer in a minute.</li> <li>2. Ask, “What are the names of the Oceans?” Again, write the answers on your screen or chart paper. If they don’t get all 5, project a map of the Earth to help them finish the list.</li> <li>3. Remind them that in the last lesson they listed the characteristics of an ocean on their Bodies of Water Worksheet. Without their worksheet, ask them to recall what they remember. Possible answers: saltwater, moves with the tides, has currents, largest body of water, names of inhabitants, etc.</li> <li>4. Ask the question: How do we know what we know about oceans? Possible answers: scientists, explorers, ROVs, etc.</li> <li>5. Explain to the students that the oceans are so large, there are parts that haven’t been explored, and we use the oceans (or one big ocean) to get from continent to continent.</li> </ol>

<p><a href="#">Can Have What You Need!</a> - Size- 7:11-11:40, World Map- 11:41-16:25, Brunswick- 23:20-27:50, Savannah- 27:51-30:30</p> <p>5. After viewing the clips, have the students come back as a whole class to report out their facts. Make a list on the SmartBoard or on chart paper.</p>	
	<p><b>VIRTUAL ACTIVITY</b></p> <p><b>Activity:</b> Have the students choose one of the clips to watch. Have them write down at least <b>5 important facts</b> they learned from their video clip:</p> <p>Clip 1 - Webinar 3 - <a href="#">The Ocean From Space</a> - Satellites- 2:29-5:25, Plants- 7:49-12:07, Satellite Data-14:50-19:34, Salinity- 19:50-24:52, Sea Ice- 27:05-32-38</p> <p>Clip 2 - Webinar 4 - <a href="#">Onward and Downward! Exploring the Deep Ocean</a> - Mapping- 12:25-17:51, Mapping Activity- 22:07-25:04, Before Sonar- 29:41-32:47, Deep Water- 35:46-42:13</p> <p>Clip 3 - Webinar 21 - <a href="#">Helping Big Ships Bring Goods into Port So You Can Have What You Need!</a> - Size- 7:11-11:40, World Map- 11:41-16:25, Brunswick- 23:20-27:50, Savannah- 27:51-30:30</p>
<p><b>IN CLASS</b></p>	<p><b>VIRTUAL ALTERNATIVE</b></p>
<p><b>Lesson Closing: (20 minutes)</b></p> <p><b>Activity:</b> You're the Captain! Worksheet: Using a <a href="#">printable map</a>, plot a course to get your ship from one city on your list to another city on your list using the "You're the Captain Worksheet" and <a href="#">printable map</a> (needs to be labeled with cities ahead of time).</p>	<p><b>Lesson Closing (Zoom): (10 minutes)</b></p> <ol style="list-style-type: none"> <li>1. Check in with the students.</li> <li>2. Review the notes from the video clips..</li> </ol>

## Lesson 3: Lakes and Ponds

**Overview of the Lesson:** The students will be learning the characteristics of lakes and ponds. Similar to the lesson on oceans, they will be looking at the unique features of lakes and ponds. They examine the inhabitants of lakes and ponds as well as the way humans interact with these bodies of water.

**Time (minutes): (45-60 minutes)**

**Standard(s):**

MA STE Standards: 2-ESS2-2

MA History and Social Science Frameworks: 2.T1 and 2.T2

Next Generation Science Standards: 2-ESS2-2 and 2-ESS2-3

**Essential Question(s):**

- What are the unique characteristics of lakes and ponds?
- What living creatures make lakes and ponds their home?
- How do humans use lakes and ponds?

**Science Objectives:**

- Students will be able to identify the characteristics of lakes and ponds
- Students will be able to locate a lake or pond on a map.

- Students will be able to name plants or animals found in lakes and ponds.

**Language Objectives and/or Targeted Academic Language:**

basin

meteor

kettle

**Anticipated Student Preconceptions/Misconceptions (optional)**

Lake and Ponds are the same thing

**Instructional Materials/Resources/Tools**

SmartBoard/Chart Paper

Computer/Internet

Oceans of the World

NOAA Live! Webinars

Online or Physical Map of the World

**Instructional Tips/Strategies/Suggestions for Teacher:** These lessons were developed to utilize the 39 NOAA Live! Recorded Webinar Videos. While certain video clips were pulled out to highlight concepts, you may want to look at the [whole playlist on YouTube](#) to see the additional resources available. If your class has a particular interest, you may find a more relevant webinar to highlight in the video section of the lesson.

**Assessment:**

Completion of activity

Teacher observations

**Science and Engineering Practices included (put the included ones in bold):**

- 1. Asking questions (for science) and defining problems (for engineering)**
- 2. Developing and using models**
- 3. Planning and carrying out investigations**

**4. Analyzing and interpreting data**

- 5. Using mathematics and computational thinking
- 6. Constructing explanations (for science) and designing solutions (for engineering)
- 7. Engaging in argument from evidence
- 8. Obtaining, evaluating, and communicating information**

**Notes about Science and Engineering Practices included:**

**Lesson Overview:** The students will be learning the characteristics of lakes and ponds. Similar to the lesson on oceans, they will be looking at the unique features of lakes and ponds. They examine the inhabitants of lakes and ponds as well as the way humans interact with these bodies of water.

IN CLASS	VIRTUAL ALTERNATIVE
<p><b>Opening/Engagement: (10-15 minutes)</b></p> <ol style="list-style-type: none"> <li>1. Ask the question: Who lives near a pond? You should get a few kids to raise their hands. If you don't get the answers you are looking for, lead them with: Who has relatives who live near a pond? Who has ever been to a pond?</li> <li>2. Write the word "pond" on one side of the SmartBoard or chart paper. Have the students describe what they know or remember about a pond. Write the answers they give you. Look for answers about the freshwater, size, depth, inhabitants, location, etc.</li> <li>3. Once you have received the answers about a pond that you are looking for, write the word "lake" next to the word "pond".</li> <li>4. Have the students use their deduction skills to give characteristics of a lake. Again, look for answers about the freshwater, size, depth, inhabitants, location, etc.</li> </ol>	<p><b>Independent Assignment: (10-15 minutes)</b></p> <ol style="list-style-type: none"> <li>1. Before the students meet with the teacher, have the students watch a grade appropriate video or two on Lakes and Ponds:  <a href="https://www.youtube.com/watch?v=mX_AN-QyXYU">https://www.youtube.com/watch?v=mX_AN-QyXYU</a>   <a href="https://app.discoveryeducation.com/learn/videos/4ef069b6-104c-42a3-95bf-ea2b31680b9a/">https://app.discoveryeducation.com/learn/videos/4ef069b6-104c-42a3-95bf-ea2b31680b9a/</a> </li> <li>2. On Google Classroom, have the students complete a short assignment related to the video.               <ol style="list-style-type: none"> <li>1. What are the characteristics of a lake or pond?</li> <li>2. What is the difference between a lake and an ocean?</li> <li>3. How are lakes and ponds formed?</li> </ol> </li> </ol>
IN CLASS	VIRTUAL ALTERNATIVE

<p><b>During the Lesson: (15-20 minutes)</b></p> <ol style="list-style-type: none"> <li>1. Have the students log into <a href="https://www.getepic.com">getepic.com</a> Their assignment is to pick one of the books about lakes or one of the books about ponds listed on the SmartBoard (make the list ahead of time). You may also assign the books through Epic.</li> <li>2. Pass out an <a href="#">observation worksheet</a> and as they read have them write down at least 5 interesting facts about lakes or ponds.</li> <li>3. Give about 10-15 minutes to complete the assignment. As the students finish, they can compare notes with other students</li> </ol>	<p><b>Meet with the Teacher (Zoom): (15-20 minutes)</b></p> <ol style="list-style-type: none"> <li>1. Ask the question: Who lives near a pond? You should get a few kids to raise their hands. If you don't get the answers you are looking for, lead them with: Who has relatives who live near a pond? Who has ever been to a pond?</li> <li>2. Write the word Pond on one side of your screen or chart paper. Have the students describe what they know or remember about a pond. Write the answers they give you. Look for answers about the freshwater, size, depth, inhabitants, location, etc.</li> <li>3. Once you have received the answers about a pond that you are looking for, write the word Lake next to the word Pond.</li> <li>4. Have the students use their deduction skills to give characteristics of a lake. Again, Look for answers about the freshwater, size, depth, inhabitants, location, etc.</li> <li>5. Pick a book from <a href="https://www.epic.com">Epic.com</a> to read with the students. There are a number of books to choose from. Have them listen for characteristics and differences for ponds and lakes.</li> </ol>
	<p><b>VIRTUAL ACTIVITY</b></p> <p><b>Activity: Ponds and Lakes Illustrations.</b> On white construction paper have the students draw an illustration of a lake or a pond from the side view. Have them start in pencil in case of errors. Make sure they include depth, inhabitants, plant life, surroundings, etc. Once approved by the teacher, they can color. Use one of the <a href="#">Epic</a> books to help you.</p>
<p><b>IN CLASS</b></p>	<p><b>VIRTUAL ALTERNATIVE</b></p>
<p><b>Lesson Closing: (20 minutes)</b> <b>Activity: Ponds and Lakes Illustrations.</b> On white construction paper have the students draw an illustration of a lake or a pond from the side view. Have them start in pencil in case of errors. Make sure they</p>	<p><b>Lesson Closing (Zoom): (10 minutes)</b></p> <ol style="list-style-type: none"> <li>1. Check in with the students.</li> <li>2. Review their drawings..</li> </ol>

include depth, inhabitants, plant life, surroundings, etc. Once approved by the teacher, they can color. Use one of the [Epic](#) books to help you.

**EXPLORE OUTDOORS:**

Make a pile of dirt in your yard or at the beach. Take a cup of water and pour the water down the side of the pile. Observe what happens to the water as it runs down the pile. What happens to the water at the bottom of the pile? Write your observations on a piece of paper.

## Lesson 4: A River Runs Through It

**Overview of the Lesson:** In this lesson, the students will explore the winding trek of rivers all around the world. They will learn that all rivers have a source and a mouth. They will use maps to discover where and how a river begins, then they will follow its winding path and they will determine what body of water it empties into. Along the way they will discover its inhabitants and how humans use rivers.

**Time (minutes): (45-60 minutes)**

**Standard(s):**

MA STE Standards: 2-ESS2-2

MA History and Social Science Frameworks: 2.T1 and 2.T2

Next Generation Science Standards: 2-ESS2-2 and 2-ESS2-3

Ocean Literacy Principles: 1 - g

**Essential Question(s):**

- What are the characteristics of a river?
- What are the names of the beginning and end of a river?
- How do humans use rivers?
- What makes up a river's ecosystem?

**Science Objectives:**

- Students will be able to name the characteristics of a river.
- Students will be able to locate the source of a river.
- Students will determine the body of water at the mouth of a river.
- Students will learn about the ecosystem of a river.

**Language Objectives and/or Targeted Academic Language**



mouth tributaries	source	course	silt
<p><b>Anticipated Student Preconceptions/Misconceptions (optional)</b> The Nile River’s source is the Mediterranean Sea</p>			
<p><b>Instructional Materials/Resources/Tools</b> SmartBoard/Chart Paper Computer/Internet Oceans of the World NOAA Live! Webinars Online or Physical Map of the World Google Map Map of the Nile River Map of the rivers in the United States</p>			
<p><b>Instructional Tips/Strategies/Suggestions for Teacher:</b> These lessons were developed to utilize the 39 NOAA Live! Recorded Webinar Videos. While certain video clips were pulled out to highlight concepts, you may want to look at the <a href="#">whole playlist on YouTube</a> to see the additional resources available. If your class has a particular interest, you may find a more relevant webinar to highlight in the video section of the lesson.</p>			
<p><b>Assessment:</b> The students will be able to identify a river on a map The students will be able to determine the source, course and mouth Teacher observations</p>			
<p><b>Science and Engineering Practices included (put the included ones in bold):</b> 1. <b>Asking questions (for science) and defining problems (for engineering)</b> 2. <b>Developing and using models</b></p>			

3. **Planning and carrying out investigations**
4. **Analyzing and interpreting data**
5. Using mathematics and computational thinking
6. Constructing explanations (for science) and designing solutions (for engineering)
7. Engaging in argument from evidence
8. **Obtaining, evaluating, and communicating information**

**Notes about Science and Engineering Practices included:**

**Lesson Overview:** In this lesson, the students will explore the winding trek of rivers all around the world. They will learn that all rivers have a source and a mouth. They will use maps to discover where and how a river begins, then they will follow its winding path and then they will determine what body of water it empties into. Along the way they will discover its inhabitants and how humans use rivers.

**IN CLASS**

**Opening/Engagement: (10-15 minutes)**

1. Project a map of the [Nile River](#) in Africa. Give the students a moment to look at the map and its details. Ask the students: What body of water do you think we are going to talk about today? If you guessed rivers you are correct.
2. Let's look at this map of the longest river in the world. Does anyone know the name of this river? If there are no correct answers, tell them the Nile River. See if they can guess the continent.
3. Tell the students that all rivers have 4 main parts: the mouth, the course, riverbanks and the mouth. See if you can determine the 4 parts of the Nile River.
4. Show the students a map of the rivers in the US.  
<https://whatsanswer.com/maps/all-water-flows-river-map-of-the-usa-1/>
5. Ask the students to guess how many rivers are in the US? a. 2,500 b. 25,000 c. 250,000 d. 2,500,000 The correct answer is c.

**VIRTUAL ALTERNATIVE**

**Independent Assignment: (10-15 minutes)**

1. Before the students meet with the teacher, have the students watch a grade appropriate video or book on Rivers:  
<https://www.getepic.com/app/read/52055>
2. On Google Classroom, have the students complete a short assignment related to the book or video.  
  
What are the parts of a river?  
How does a river form?  
What are the characteristics of a river?

IN CLASS	VIRTUAL ALTERNATIVE
<p><b>During the Lesson: (30-40 minutes)</b></p> <p>1. If time allows, have the students complete each center. Feel free to stretch this into two lessons if necessary.</p> <p>River Centers:</p> <p>Center 1 - Finding <a href="#">Source and Mouth Worksheet</a> - Using Google Earth, the student will be given the names and locations of 5 rivers. Their assignment will be to locate the river on the map, determine the source, track the course and identify the body of water at the mouth.</p> <p>Center 2 - Amazon River's Ecosystem - Watch <a href="https://www.getepic.com/app/read/26353">https://www.getepic.com/app/read/26353</a> Complete an <a href="#">Observations Worksheet</a> with 5 important facts from the video.</p> <p>Center 3 - NOAA Live! Webinar 15 - <a href="#">Swimming Upstream with River Herring</a> - 21:20 - 25:51</p> <p>Complete the River Herring <a href="#">life cycle worksheet</a> and label what water body the fish is in at each stage of the life cycle.</p> <p>Center 4 - NOAA Live! Webinar 26 - <a href="#">The Life of Hawaiian Bonefishes</a> - 35:14-38</p> <p>Complete the Bonefish <a href="#">life cycle worksheet</a> and label what water body the fish is in at each stage of the life cycle.</p> <p>2. Give each center about 12-15 minutes</p>	<p><b>Meet with the Teacher (Zoom): (15-20 minutes)</b></p> <p>1. Project a map of the Nile River in Africa. Give the students a moment to look at the map and its details. Ask the students: What body of water do you think we are going to talk about today? If you guessed rivers you are correct.</p> <p>2. Let's look at this map of the longest river in the world. Does anyone know the name of this river? If there are no correct answers, tell them the Nile River. See if they can guess the continent.</p> <p>3. Tell the students that all rivers have 4 main parts: the mouth, the course, riverbanks and the mouth. See if you can determine the 4 parts of the Nile River.</p> <p>4. Show the students a map of the rivers in the US. <a href="https://whatsanswer.com/maps/all-water-flows-river-map-of-the-usa-1/">https://whatsanswer.com/maps/all-water-flows-river-map-of-the-usa-1/</a></p> <p>5. Ask the students to guess how many rivers are in the US? a. 2,500 b. 25,000 c. 250,000 d. 2,500,000 The correct answer is c.</p>
	<p><b>VIRTUAL ACTIVITY</b></p> <p>Choose one of the following River Centers to complete:</p> <p><b>Center 1</b> - Finding <a href="#">Source and Mouth Worksheet</a> - Using Google Earth, the student will be given the names and locations of 5 rivers. Their assignment will be to locate the river on the map, determine the source, track the course and identify the body of water at the mouth.</p> <p><b>Center 2</b> - Amazon River's Ecosystem - Watch <a href="https://www.getepic.com/app/read/26353">https://www.getepic.com/app/read/26353</a> Complete an <a href="#">Observations Worksheet</a></p> <p><b>Center 3</b> - NOAA Live! Webinar 15 - <a href="#">Swimming Upstream with River</a></p>

	<p><a href="#">Herring</a> - 21:20 - 25:51 Complete the River Herring <a href="#">life cycle worksheet</a> and label what water body the fish is in at each stage of the life cycle.</p> <p><b>Center 4</b> - NOAA Live! Webinar 26 - <a href="#">The Life of Hawaiian Bonefishes</a> - 35:14-38 Complete the Bonefish <a href="#">life cycle worksheet</a> and label what water body the fish is in at each stage of the life cycle.</p>
<p><b>IN CLASS</b></p>	<p>VIRTUAL ALTERNATIVE</p>
<p><b>Lesson Closing: (10 minutes)</b></p> <ol style="list-style-type: none"> <li>1. After centers, come back and have the students recap what they have learned.</li> <li>2. Watch the following video: <a href="https://www.youtube.com/watch?v=yyMJDZOM7XI">https://www.youtube.com/watch?v=yyMJDZOM7XI</a></li> </ol>	<p><b>Lesson Closing (Zoom): (10 minutes)</b></p> <ol style="list-style-type: none"> <li>1. Check in with the students.</li> <li>2. Review the Virtual Activity with the students.</li> </ol>
	<p><b>EXPLORE OUTDOORS:</b></p>

## Information to Support Teaching Learning - Dive Deeper

What additional resources can support teachers in developing background understanding of content or ideas in this unit?

Woods Hole SeaGrant: <https://seagrant.whoi.edu/suggested-educational-resources-for-use-during-school-closures/webinars-noaa-live/>

Complete List of NOAA Live! Webinars: <https://www.youtube.com/playlist?list=PL1CGd4Scv4GICVRODGA8RRvzocNN1IL8H>

Epic Books - <https://www.getepic.com/>

If you use the NOAA Live! webinars and curriculum in your class you are encouraged to contact Grace Simpkins at Woods Hole Sea Grant to receive free NOAA Live! iron-on patches for each of the students in your classroom. Please e-mail Grace at [gsimpkins@whoi.edu](mailto:gsimpkins@whoi.edu)

## List of Unit Resources (in lesson sequence)

What additional resources can support the teaching and learning of this unit? What resources can support the teacher in implementing the unit?

### **Lesson 1:**

Map of the Earth: <https://www.worldatlas.com/aatlas/newart/continentslg.gif>

Forms of Water: [https://prd-wret.s3.us-west-2.amazonaws.com/assets/palladium/production/s3fs-public/styles/full\\_width/public/thumbnails/image/test-wss-banner.jpg](https://prd-wret.s3.us-west-2.amazonaws.com/assets/palladium/production/s3fs-public/styles/full_width/public/thumbnails/image/test-wss-banner.jpg)

Earth's Water: [https://docs.google.com/presentation/d/1pqrIYbwkPdru\\_21RFWFS\\_BOFQ7EvQdUpqVK9mkbsZOU/edit#slide=id.p](https://docs.google.com/presentation/d/1pqrIYbwkPdru_21RFWFS_BOFQ7EvQdUpqVK9mkbsZOU/edit#slide=id.p)

75% - <http://www.grandpencil.net/projects/watercov.htm>

Globe: <https://solarsystem.nasa.gov/resources/373/earth-our-living-planet/>

Massachusetts' Lakes and Rivers: <https://geology.com/state-map/maps/massachusetts-rivers-map.gif>

Bodies of Water Worksheet: [https://docs.google.com/presentation/d/1SnMGolyF-dOK1qLXr4KoOiKDVZwm5U\\_X6Pe7gNwKj6E/edit#slide=id.p](https://docs.google.com/presentation/d/1SnMGolyF-dOK1qLXr4KoOiKDVZwm5U_X6Pe7gNwKj6E/edit#slide=id.p)

Bodies of Water Video: <https://www.youtube.com/watch?v=bNWuQD7QHbc>

## **Lesson 2:**

Map of the Earth: <https://worldmapwithcountries.net/wp-content/uploads/2018/11/world-map-slide1.png>

Oceans of the World: <https://www.youtube.com/watch?v=4sj0oLmKG9Q>

NOAA Live! Webinars: <https://www.youtube.com/playlist?list=PL1CGd4Scv4GICVRODGA8RRvzocNN1IL8H>

You're the Captain Worksheet: <https://docs.google.com/document/d/13BZjcQu-6OaaO5wHxrvuZdTDMK9knRPAoTMx-Oaio1Q/edit>

World Map - <https://worldmapwithcountries.net/wp-content/uploads/2018/11/world-map-slide1.png>

Printable Map - <https://www.waterproofpaper.com/printable-maps/world/world-map.pdf>

Observation Worksheet - [https://docs.google.com/document/d/1Yd2WhG8KqkAz737DQeO2GDhgCPeL0WGoyWkp\\_mfn9\\_o/edit](https://docs.google.com/document/d/1Yd2WhG8KqkAz737DQeO2GDhgCPeL0WGoyWkp_mfn9_o/edit)

### **Lesson 3:**

Get Epic.com - [www.getepic.com](http://www.getepic.com)

Video - [https://www.youtube.com/watch?v=mX\\_AN-QyXYU](https://www.youtube.com/watch?v=mX_AN-QyXYU)

Video - <https://app.discoveryeducation.com/learn/videos/4ef069b6-104c-42a3-95bf-ea2b31680b9a/>

Observation Worksheet - [https://docs.google.com/document/d/1Yd2WhG8KqkAz737DQeO2GDhgCPeL0WGoyWkp\\_mfn9\\_o/edit](https://docs.google.com/document/d/1Yd2WhG8KqkAz737DQeO2GDhgCPeL0WGoyWkp_mfn9_o/edit)

### **Lesson 4:**

River Book - <https://www.getepic.com/app/read/52055>

Map of the Nile River - [https://upload.wikimedia.org/wikipedia/commons/thumb/2/25/River\\_Nile\\_map.svg/1024px-River\\_Nile\\_map.svg.png](https://upload.wikimedia.org/wikipedia/commons/thumb/2/25/River_Nile_map.svg/1024px-River_Nile_map.svg.png)

Rivers in USA - <https://whatsanswer.com/maps/all-water-flows-river-map-of-the-usa-1/>

Source and Mouth Worksheet - <https://docs.google.com/document/d/1do1Fa9Whp4aQE90F4gAgwJWMMykCxTicuIHK6UIBvBCU/edit>

Observation Sheet - [https://docs.google.com/document/d/1Yd2WhG8KqkAz737DQeO2GDhgCPeL0WGoyWkp\\_mfn9\\_o/edit](https://docs.google.com/document/d/1Yd2WhG8KqkAz737DQeO2GDhgCPeL0WGoyWkp_mfn9_o/edit)

Amazon Video - <https://www.getepic.com/app/read/26353>

Voyage of the River Herring - <https://www.youtube.com/watch?v=uONrDwin5K0&list=PL1CGd4Scv4GICVRODGA8RRvzocNN1L8H&index=16&t=1723s>

Life Cycle Worksheet - [https://docs.google.com/presentation/d/11pxc\\_z8xwde3uyJ\\_PUs2MfCp9Qc2IMiHU58auKbYeg8/edit#slide=id.p](https://docs.google.com/presentation/d/11pxc_z8xwde3uyJ_PUs2MfCp9Qc2IMiHU58auKbYeg8/edit#slide=id.p)

Follow the River Video - <https://www.youtube.com/watch?v=yyMJDZOM7XI>

## **Curriculum Embedded Performance Assessment (CEPA; if applicable)**

Detail the performance assessment and include any rubrics or resources