Life Cycles: Animals and Plants

Same but Different

Science Grade 3

In this unit, students will build upon their prior knowledge of animal and plant life cycles. Beyond knowing that all living things live and die, the students will learn that although different, all plants and animals have a similar cycle of life. Students will outline the basic stages of both land and marine animals in this unit. Using graphic representation, students will display an understanding of the “same but different” cycles of life. At the end of the unit, students will have observed, by different media, and have a collection of drawings of many different animal and plant life cycles.

**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?

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

1. 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. Another inspiration for this unit is to build upon the life cycle lessons from 2nd grade. In 2nd grade, the students learn the basic life cycle of animals, often a butterfly, through the use of books and other media. This year in particular (spring 2020), most students switched to remote learning before they were able to observe the lifecycle of a butterfly in their class starting from an egg to the point where they are released. The other inspiration is the diverse ecosystem we have in our area of Cape Cod. Due to our unique relationship with the ocean, the students have access to numerous marine and land animals not found in other parts of the country. Combining the student’s prior knowledge of lifecycles and their access to a diverse ecosystem will make for a fun and informative unit.

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

In this unit, the students should learn that although very different in some ways, animals and plants have a very similar life cycle. They may or may not already know this, but this unit will expose them to a diverse group of animals and plants so that they can compare and contrast and observe this firsthand. By the end of the unit, the students will also have a better understanding of how delicate life cycles can be and how humans impact their life cycle.

1. What might students find exciting in this unit?

The students will be able to access material from NOAA Live! Webinars which feature real scientists from across the country, as well as from other sources, and make their own observations to build upon their knowledge of life cycles. The science community has studied a variety of marine and land animals which allows the students to choose the species that most excites them to explore these concepts. Many of the students see these animals and plants everyday, but this will give them the opportunity to take a deeper look and learn more about the diversity surrounding them.

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

The standards addressed in this unit will focus mostly on life science. The real-world content is all around them. All living things are born, grow and change, reproduce, and eventually die. The goal of this unit will be to get the students to stop and think about the animals and plants they see everyday.

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

In this unit we will provide the students with the opportunity to view many different animals in their natural habitat through the scientific and technological advances created right here in our area. By using the National Oceanic and Atmospheric Administration (NOAA)’s and the Woods Hole Oceanographic Institution (WHOI)’s resources and their unique knowledge of this area’s ecosystem, the students will have an opportunity to study living creatures that many other students may never see.

1. What’s the most important lesson you learned as you created this?

I learned that many of the existing unit plans and lessons we use are based on terrestrial species. Working on this unit, I was able to change my focus from terrestrial living things to marine living things.

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

Reach out to the local science community for additional resources. With the possibility of remote learning, field trips may not be possible. The outreach departments of the scientific community will be eager to come up with different ways to pass their knowledge onto the students. Virtual classroom visits and virtual field trips may be possible and many aquaria and zoos have added virtual resources to their websites.

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| **Stage 1 Desired Results** | |
| **MA STE Standards:**  3-LS1-1. Use simple graphical representations to show that different types of organisms have unique and diverse life cycles. Describe that all organisms have birth, growth, reproduction, and death in common but there are a variety of ways in which these happen.  Clarification Statements:  • Examples can include different ways plants and animals begin (e.g., sprout from a seed, born from an egg), grow (e.g., increase in size and weight, produce a new part), reproduce (e.g., develop seeds, root runners, mate and lay eggs that hatch), and die (e.g., length of life).  • Plant life cycles should focus on those of flowering plants.  • Describing variation in organism life cycles should focus on comparisons of the general stages of each, not specifics.  **Next Generation Science Standards:**  3-LS1-1 Develop models to describe that organisms have unique life cycles, but all have in common birth, growth, reproduction and death.  **Ocean Literacy Principles:**  5 The ocean supports a great diversity of life and ecosystems.  • d. Ocean biology provides many unique examples of life cycles, adaptations and important relationships among organisms (symbiosis, predator-prey dynamics, and energy transfer) that do not occur on land.  • i. Estuaries provide important and productive nursery areas for many marine and aquatic species. | **ESSENTIAL QUESTIONS:**  **What is a life cycle?**  **What are the stages of a life cycle?**  **How are the life cycles different among different species?**  **How are life cycles the same between different species?** |
| **UNDERSTANDINGS:**  **The students will understand that although animals and plants are very different, the basic stages of life are similar.**  **The students will recognize the differences in stages due to adaptations to their habitat.**  **The students will be skilled at drawing and labeling the graphic representation of an animal or plants life cycle.** |
| **TRANSFER:**  **Students will be able to independently use their learning to observe animals and plants around them in their community and share that information with others.**  **Students will also understand the impact humans have on delicate ecosystems.**  **Students will learn about the great and unique scientific resources available in our community.** |
|  | **Cross-Curricular Connections**  [CCSS.ELA-LITERACY.RL.3.1](http://www.corestandards.org/ELA-Literacy/RL/3/1/)  Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers.  [CCSS.ELA-LITERACY.RI.3.3](http://www.corestandards.org/ELA-Literacy/RI/3/3/)  Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text, using language that pertains to time, sequence, and cause/effect.  [CCSS.ELA-LITERACY.RI.3.4](http://www.corestandards.org/ELA-Literacy/RI/3/4/)  Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a *grade 3 topic or subject area*.  [CCSS.ELA-LITERACY.RI.3.5](http://www.corestandards.org/ELA-Literacy/RI/3/5/)  Use text features and search tools (e.g., key words, sidebars, hyperlinks) to locate information relevant to a given topic efficiently.  [CCSS.ELA-LITERACY.RI.3.7](http://www.corestandards.org/ELA-Literacy/RI/3/7/)  Use information gained from illustrations (e.g., maps, photographs) and the words in a text to demonstrate understanding of the text (e.g., where, when, why, and how key events occur).  [CCSS.ELA-LITERACY.W.3.7](http://www.corestandards.org/ELA-Literacy/W/3/7/)  Conduct short research projects that build knowledge about a topic. |
| **Stage 2 Evidence** | |
| **Formative Assessment Ideas:**  Define the components of an animal and plant life cycle  Daily teacher observations | |
| **Summative Assessment Ideas:**  Projects  Hands-on activities  Teacher observations | |
| **Stage 3 Learning Plan** | |
| **Summary of Key Learning Events and Instruction**  **Lesson 1: What is a life cycle? -** The students will learn the six most well known groups of animals: mammals, fish, birds, invertebrates (animals without a backbone), amphibians and reptiles. Each different classification contributes unique characteristics to its life cycle. They will learn that a life cycle is broken into stages that form a circle.    **Lesson 2: Marine Animals -** This lesson will explore a unique group of marine animals and their different life cycles. The students will make the connection between where we live, animals they are familiar with, and the study of marine life cycles.  **Lesson 3: The Life Cycle of a Plant -** Students will examine the life cycle of a flowering plant. Students will examine eelgrass (*Zostera)* and its unique life cycle as well as draw connections to the grass that grows in their yards.  **Lesson 4: Comparing Plants and Animals -** In this lesson, students will compare and contrast the life cycles of animals and plants. | |

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

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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 a life cycle? | Introductory and Constructing | Stages of a life cycle  Animal classification  Common stages of a life cycle | 3-LS1-1 |
| 1. Marine Animals | Constructing and Practice | Unique marine life cycles  How we study marine animals | 3-LS1-1 |
| 1. The Life Cycle of a Plant | Constructing and Practice | Stages of a plant life cycle  Unique plants | 3-LS1-1 |
| 1. Comparing Plants and Animals | Constructing , Practice, Assessment | Comparing and contrasting  How life cycles are similar  How life cycle are different | 3-LS1-1 |

**Lesson 1: What is a Life Cycle?**

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| **Overview of the Lesson:** In this lesson, the students will learn that all living things share the same 4 stages of life: birth, growth, reproduction and death. Although the stages are the same, every animal and plant is unique.  **Time (minutes): (45-60 minutes)** | |
| **Standard(s):**  MA STE Standaard: 3-LS1-1.  Next Generation Science Standard: 3-LS1-1  Ocean Literacy Principle: 5-d, i | |
| **Essential Question(s):**   * What are the 4 common stages of a life cycle? * Why is a drawing of a life cycle in a circle? | |
| **Science Objectives:**   * The students will learn the definition of a life cycle. * The students will learn the stages of a life cycle. * The students will model a life cycle of an animal. | |
| **Language Objectives and/or Targeted Academic Language:**   |  |  |  |  | | --- | --- | --- | --- | | **cycle** | **stages** | **growth** | **development** | | **mature** | **reproduction** |  |  | | |
| **Anticipated Student Preconceptions/Misconceptions (optional)** | |
| **Instructional Materials/Resources/Tools:**  SmartBoard/Chart paper  Computer/Internet | |
| **Assessment:**  Completion of multiple life cycle models  Teacher observations | |
| **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](https://www.youtube.com/playlist?list=PL1CGd4Scv4GICVRODGA8RRvzocNN1lL8H) 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. | |
| **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 that all living things share the same 4 stages of life: birth, growth, reproduction and death. Although the stages are the same, every animal and plant is unique. The students will become familiar with the 6 most common groups of animals. | |
| **IN CLASS** | VIRTUAL ALTERNATIVE |
| **Opening/Engagement: (5-10 minutes)**  1. The class will start in small groups of 3-4, the lesson will begin by having the teacher pass out 6 Header index cards with the classification words Mammals, Fish, Birds, Amphibians, Reptiles and Invertebrates. The teacher will also pass out index cards with the names (and pictures if possible) of a variety of animals (Print out pdf - [LC\_activity 1\_index card picture sheets](https://drive.google.com/file/d/1C092_s7BpUMo0FSmlhZ6PvddnGo6Fjbp/view?usp=sharing))  2. In their groups, the students will put the headers at the top of a desk or table. They will then match the animal cards to the proper header. (example: dog would go directly under mammal)  3. After a few minutes for the students to sort their cards, the teacher will ask for a definition or description of the header cards. What is a mammal? What is a fish? What is an insect? Etc. Answers can be written on the SmartBoard or Chart Paper.  4. Once the definitions are complete, tell the students, “We are now going to learn about the different life cycles of these animals.” | **Independent Assignment: (15-20 minutes)**  1. Before the students meet with the teacher, have the students watch a grade appropriate video or two on life cycles:  <https://www.youtube.com/watch?v=7hSnpkGyXx4&t=4s>  2. In Google Classroom, have the students complete the following assignment:  How many stages of life are there?  Why is the life cycle shaped like a circle?  Are plant and animal life cycles different or the same? |
| **IN CLASS** | VIRTUAL ALTERNATIVE |
| **During the Lesson: (15-20 minutes)**  1. Ask the students to turn to a neighbor and answer the following question, “What do we mean when we talk about an animal’s life cycle?” The teacher should circulate around the room and listen for correct answers. The answers should include the terms born, grow up, die, feed, eggs, pupa, reproduce (have babies), etc.  2. After a few minutes, ask the students to share their ideas with the rest of the class.  3. This is the time for the teacher to explain that all the terms that they came up with are known as “stages”. Inform the students that “stages” is an important word that the students will need when describing the life cycle of a plant or animal. The life cycle of a plant or animal is broken up into stages. The stages are represented in a circle, sometimes called the circle of life.  4. Now you will tie in the opening activity. The stages of an animal’s life cycle depend on the classification of the animal. Write the words dog and butterfly on the SmartBoard or on Chart Paper. Have the students think of the names of the stages of each animal’s life cycle. List the stages as the students give you the answers. | **Meet with the Teacher (Zoom): (15-20 minutes)**  1. Tell the students, “We are now going to learn about the different life cycles of these animals.”  2. Ask the students to turn to a neighbor and answer the following question, “What do we mean when we talk about an animal’s life cycle?” The teacher should circulate around the room and listen for correct answers. The answers should include the terms born, grow up, die, feed, eggs, pupa, etc.  3. After a few minutes, ask the students to share their ideas with the rest of the class.  4. This is the time for the teacher to explain that all the terms that they came up with are known as “stages”. Inform the students that “stages” is an important word that the students will need when describing the life cycle of a plant or animal. The life cycle of a plant or animal is broken up into stages. The stages are represented in a circle, sometimes called the circle of life.  5. Now you will tie in the opening activity. The stages of an animal’s life cycle depend on the classification of the animal. Write the words dog and butterfly on your screen or on Chart Paper. Have the students think of the names of the stages of each animal’s life cycle. List the stages as the students give you the answers. |
|  | VIRTUAL ACTIVITY  **Activity: Life cycle Presentation: Use your** [**Life Cycle Worksheet**](https://docs.google.com/presentation/d/11pxc_z8xwde3uyJ_PUs2MfCp9Qc2IMiHU58auKbYeg8/edit) **to make a google slide. Your slide should include at least 4 pictures of a Human or Animal Life Cycle. The pictures should include the 4 stages of a life: Newborn (birth), teenager(growth), adult (reproducers), and aged (death).** |
| **IN CLASS** | VIRTUAL ALTERNATIVE |
| **Lesson Closing (15-20 minutes)**  **Activity: Life cycle Presentation: Use your** [**Life Cycle Worksheet**](https://docs.google.com/presentation/d/11pxc_z8xwde3uyJ_PUs2MfCp9Qc2IMiHU58auKbYeg8/edit) **to make a google slide. Your slide should include at least 4 pictures of a Human or Animal Life Cycle. The pictures should include the 4 stages of a life: Newborn (birth), teenager(growth), adult (reproducers), and aged (death).** | **Lesson Closing (Zoom): (10 minutes)**  1. Check in with the students.  2. Have the students show their Life Cycle Worksheets |
|  | **EXPLORE OUTDOORS:**  See how many stages of the life cycle you can find. Example: a [tomato plant](https://media1.thehungryjpeg.com/thumbs2/800_3611138_jfwxhsxdwlc5wt0o8w5i7sserlkyjnnp4k17921z_tomato-plant-growth-stages.jpg) - it may be in the adult stage, there may be flowers or tomatoes, inside the tomatoes will be seeds. You may find a dead bug or adult worm. |

**Lesson 2: Marine Animals**

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| **Overview of the Lesson:** In this lesson, the students will examine the life cycle of a marine animal. The students will learn from NOAA scientists about unique marine animals and their unique habitats. They will diagram and label a life cycle for their animal.  **Time (minutes): (45-60 minutes)** | |
| **Standard(s):**  MA STE Standards: 3-LS1-1  Next Generation Science Standards: 3-LS1-1  Ocean Literacy Principle: 5-d, i | |
| **Essential Question(s):**   * What is a marine animal? * Where can marine animals live? * How does a marine animal’s life cycle differ from a land animal’s life cycle? | |
| **Science Objectives:**   * Students will learn about marine animals. * Students will view marine animals in their natural habitats. * Student’s will correctly complete life cycle diagrams. | |
| **Language Objectives and/or Targeted Academic Language**   |  |  |  |  | | --- | --- | --- | --- | | **marine** | **metamorphosis** | **larva** | **pupa** | | **reproduce** | **endangered** | **adaptation** |  | | |
| **Anticipated Student Preconceptions/Misconceptions (optional)** | |
| **Instructional Materials/Resources/Tools:**  SmartBoard/Chart paper  Computer/Internet  Blank life cycle diagram | |
| **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](https://www.youtube.com/playlist?list=PL1CGd4Scv4GICVRODGA8RRvzocNN1lL8H) 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:**  Correct completion of the life cycle diagram  Teacher observation | |
| **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](https://www.youtube.com/playlist?list=PL1CGd4Scv4GICVRODGA8RRvzocNN1lL8H) 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. | |
| **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 examine the life cycle of a marine animal. The students will learn from NOAA scientists about unique marine animals and their unique habitats. They will diagram and label life cycle diagrams. | |
| **IN CLASS** | VIRTUAL ALTERNATIVE |
| **Opening/Engagement: (15-20 minutes)**   1. The lesson will begin with a preview of the vocabulary words for this lesson. The students will be asked to match the words with their correct definition. 2. The students will be asked, “Why is it important for this class to spend time learning about the life cycle of marine animals?” Allow the students to turn and talk with a neighbor. Bring their attention back to the group and have the students share answers with the class. 3. We are looking for the following answers: We live near water. We have lakes, ponds, rivers and an ocean near us. Understanding the life cycles of marine animals may help us to better take care of those animals and understand human stages better. 4. Finish the opening by explaining that we are very lucky to have NOAA and WHOI right down the road in Woods Hole. The scientists in Woods Hole spend a great deal of time studying these animals and now they are going to share their knowledge with us. | **Independent Assignment: (15-20 minutes)**  1. Before the students meet with the teacher, have the students watch a grade appropriate video or two on Animal Life Cycles:  [NOAA Live! Webinar 38 - The Wonderful World of Plankton - 41:45-45:05](https://www.youtube.com/watch?v=P3p0pLDw8Kc&list=PL1CGd4Scv4GICVRODGA8RRvzocNN1lL8H&index=39&t=3216s)  <https://www.youtube.com/watch?v=ivx6w56Zad4>  2. In Google Classroom, have the students complete the following assignment:  What are the 4 stages of a life cycle?  Why is a life cycle in the form of a circle? |
| **IN CLASS** | VIRTUAL ALTERNATIVE |
| **During the Lesson: (20-25 minutes)**   1. Have the students pick one of the videos from below:  NOAA Live! Webinar 13: [Leaping for Atlantic Salmon](https://www.youtube.com/watch?v=0YEk0_Ku_tI&list=PL1CGd4Scv4GICVRODGA8RRvzocNN1lL8H&index=14&t=925s) - 11:21-15:15 NOAA Live! Webinar 15 - [Swimming Upstream with River Herring](https://www.youtube.com/watch?v=uONrDwin5K0&list=PL1CGd4Scv4GICVRODGA8RRvzocNN1lL8H&index=15) - 21:20 - 25:51 NOAA Live! Webinar 23: [Winged Ambassadors: Ocean Travelers](https://www.youtube.com/watch?v=QvfkTctb3zs&list=PL1CGd4Scv4GICVRODGA8RRvzocNN1lL8H&index=23) - 26:50 - 31:37 NOAA Live! Webinar 26 - [The Life of Hawaiian Bonefishes](https://www.youtube.com/watch?v=VYJ71GR7aVc&list=PL1CGd4Scv4GICVRODGA8RRvzocNN1lL8H&index=26) - 35:14-38  Bonefish - H[abitat and life cycle activity](https://www.fisheries.noaa.gov/resource/educational-materials/habitat-mapping-follow-oio-throughout-their-life-cycle)  NOAA Live! Webinar 29 - [The Amazing Story of the Horseshoe Crab](https://www.youtube.com/watch?v=AWOkAIZxdW8&list=PL1CGd4Scv4GICVRODGA8RRvzocNN1lL8H&index=29) - 27:50 - 31:29 NOAA Live! Webinar 38 - [The Wonderful World of Plankton: the Tiny Animals of the Sea](https://www.youtube.com/watch?v=P3p0pLDw8Kc&list=PL1CGd4Scv4GICVRODGA8RRvzocNN1lL8H&index=38) - 41:45-45:05 and 49:07 - 51:50 **Activity: Have each student pick one of the preceding video clips to view. After viewing the clip, the students will complete an empty** [**Life Cycle diagram**](https://docs.google.com/presentation/d/11pxc_z8xwde3uyJ_PUs2MfCp9Qc2IMiHU58auKbYeg8/edit?usp=sharing) **with drawings, labels and stages.**  **\*Ask the students to listen for how long each life stage lasts for their particular animal as they will use that information in lesson 4. (The albatross video does not have that information so you can tell that the Laysan Albatross eggs hatch in late January to mid February, the chicks fledge (fly away from the next) around mid June-late July and start laying their own eggs when they are 6-8 years old).**  **The students will then write a 4-5 sentence paragraph describing in words the life cycle of their animal. You can print out a photo of their chosen animal (**[**see Pictures for LC\_activity 2**](https://drive.google.com/drive/folders/1cUPgQ4wNCHKPvvKXRcgJJxGH8l81HMJB?usp=sharing)**) for them to put on their life cycle diagram and send home a coloring sheet of their chosen animal.** | **Meet with the Teacher (Zoom): (15-20 minutes)**  1. The lesson will begin with a preview of the vocabulary words for this lesson. The students will be asked to match the words with their correct definition.  2. The students will be asked, “Why is it important for this class to spend time learning about the life cycle of marine animals?”  3. We are looking for the following answers: We live near water. We have lakes, ponds, rivers and an ocean near us. We have a lot of scientists in Falmouth.  4. Finish the opening by explaining that we are very lucky to have NOAA and WHOI right down the road in Woods Hole. The scientists in Woods Hole spend a great deal of time studying these animals and now they are going to share their knowledge with us.  5. Watch NOAA Live! Webinar 29 - [The Amazing Story of the Horseshoe Crab](https://www.youtube.com/watch?v=AWOkAIZxdW8&list=PL1CGd4Scv4GICVRODGA8RRvzocNN1lL8H&index=29) - 27:50 - 31:29 |
|  | VIRTUAL ACTIVITY  **Activity: Have each student pick one of the preceding video clips to view. After viewing the clip, the students will complete an empty** [**Life Cycle diagram**](https://docs.google.com/presentation/d/11pxc_z8xwde3uyJ_PUs2MfCp9Qc2IMiHU58auKbYeg8/edit?usp=sharing) **with drawings, labels and stages. The students will then write a 4-5 sentence paragraph describing in words the life cycle of their animal. You can print out a photo of their chosen animal (**[**see Pictures for LC\_activity 2**](https://drive.google.com/drive/folders/1cUPgQ4wNCHKPvvKXRcgJJxGH8l81HMJB?usp=sharing)**) for them to put on their life cycle diagram and send home a coloring sheet of their chosen animal.** |
| **IN CLASS** | VIRTUAL ALTERNATIVE |
| **Lesson Closing: (20 minutes):**  Have the students present their drawings. | **Lesson Closing (Zoom): (10 minutes)**  1. Check in with the students.  2. Have the students present their drawings. |

**Lesson 3: The Life Cycle of a Plant**

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| **Overview of the Lesson:** In this lesson, the students will review the structure of a flowering plant. The students will then examine eel grass and its unique life cycle.  **Time (minutes): (45-60 minutes)** | |
| **Standard(s):**  MA STE Standards: 3-LS1-1  Next Generation Science Standards: 3-LS1-1  Ocean Literacy Principle: 5-d, i | |
| **Essential Question(s):**   * What is the common structure of a flowering plant? * What are the stages of a plant’s life cycle? * Why is eelgrass important to its ecosystem? | |
| **Science Objectives:**   * Students will be able to label the structure of a plant. * Students will be able to name the stages of a plant’s life cycle. | |
| **Language Objectives and/or Targeted Academic Language:**   |  |  |  |  | | --- | --- | --- | --- | | **germinate** | **roots** | **stem** | **seedlings** | | **seeds** | **flower** | **fruit** |  | | |
| **Anticipated Student Preconceptions/Misconceptions (optional):** | |
| **Instructional Materials/Resources/Tools:**  SmartBoard/Chart paper  Computer/Internet  Blank Life Cycle Sheet | |
| **Assessment:**  Students will correctly complete a diagram of a plant’s life cycle.  Teacher observation | |
| **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](https://www.youtube.com/playlist?list=PL1CGd4Scv4GICVRODGA8RRvzocNN1lL8H) 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. | |
| **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 review the structure of a flowering plant. The students will then examine eel grass and its unique life cycle and draw comparisons to the grass in their yards. | |
| **IN CLASS** | VIRTUAL ALTERNATIVE |
| **Opening/Engagement: (10-15 minutes)**   1. Project a [picture of a plant](https://www.worksheetplace.com/mf_pdf/Label-The-Plant-Parts.pdf) on the SmartBoard. Ask the students to recall what they know about the structure of a plant. They should be able to label the roots, stem, leaves, flowers and seeds. 2. Display a [blank life cycle diagram](https://docs.google.com/presentation/d/11pxc_z8xwde3uyJ_PUs2MfCp9Qc2IMiHU58auKbYeg8/edit#slide=id.p) and write the words birth, growth, reproduce and death. 3. Have the students tell you which box to put each word in. Have them give the specific names for the stages: germinate, seed, and seedling. | **Independent Assignment: (10-15 minutes)**  1. Before the students meet with the teacher, have the students watch a grade appropriate video or two on Plant Life Cycles:  <https://www.youtube.com/watch?v=zPqnYYI2Uq8>  2. In Google Classroom, have the students complete the following assignment:  What are the four stages of a plant’s life cycle?  How does a plant life cycle differ from an animal life cycle? |
| **IN CLASS** | VIRTUAL ALTERNATIVE |
| **During the Lesson: (20-25 minutes)**   1. Project a [picture of the grass in a yard](https://www.saferbrand.com/media//articles/images/856/green_lawn_shutterstock_71264710.jpg). Ask them, “What can you tell me about this picture and the plant?” Have them list all they know about grass. (Note for teachers: Grass can spread vegetatively through stems that spread outward from the stem either above ground (stolons) or underground (rhizomes). Grasses can also flower, be pollinated, and produce seeds). Write the information on the SmartBoard. Have them think about the life cycle, ecosystem, habitat, seed dispersal, etc. 2. Explain to the students that will be examining a marine plant very similar to grass today. If needed, remind them what marine means. Ask the student to think about a plant that grows in or near the water. 3. Project a picture of [eel grass](https://www.google.com/imgres?imgurl=http%3A%2F%2Fs1.thingpic.com%2Fimages%2F3Q%2FR1SaFaS8iw3TCRHS2MVuyYFh.jpeg&imgrefurl=https%3A%2F%2Fwww.thinglink.com%2Fscene%2F598279638317268992&tbnid=kzqFXEZx9O-l-M&vet=12ahUKEwjx0qH2oe7qAhVriOAKHQp0BuYQMyggegUIARCRAg..i&docid=avUI_sASVtz1xM&w=750&h=525&q=eelgrass&ved=2ahUKEwjx0qH2oe7qAhVriOAKHQp0BuYQMyggegUIARCRAg) onto the screen. Ask them, “What can you tell me about this picture?” Write the information on the SmartBoard. Have them think about the life cycle, ecosystem, habitat, seed dispersal, etc. (Note for teachers: eel grass can grow vegetatively or flower and produce seeds - just like the grass in your yard. For eel grass, dispersal is by the water instead of the wind on land. They are designed to sink to the bottom as they need to grow from the sediment) 4. Compare the yard grass to the eel grass. 5. Ask the questions: What does eel grass need to grow? How does eel grass support its ecosystem? (Both grasses need carbon dioxide, sunlight, and nutrients. Both are food and habitat for many animals.) 6. Project the [life cycle pictures of eel grass](http://www.seagrassli.org/ecology/eelgrass/life_history.html) on the board and with the students have everyone fill out an empty [Life Cycle diagram](https://docs.google.com/presentation/d/11pxc_z8xwde3uyJ_PUs2MfCp9Qc2IMiHU58auKbYeg8/edit?usp=sharing) with drawings, labels and stages. 7. Have the students explain how the cycle works. Lead the students through each picture. \*Make special note of how long each life stage lasts as the students will need that for lesson 4. | **Meet with the Teacher (Zoom): (15-20 minutes)**  1. Project a [picture of a plant on your screen](https://www.worksheetplace.com/mf_pdf/Label-The-Plant-Parts.pdf). Ask the students to recall what they know about the structure of a plant. They should be able to label the roots, stem, leaves, flowers and seeds.  2. Display a [blank life cycle diagram](https://docs.google.com/presentation/d/11pxc_z8xwde3uyJ_PUs2MfCp9Qc2IMiHU58auKbYeg8/edit#slide=id.p) and write the words birth, growth, reproduce and death.  3. Have the students tell you which box to put each word in. Have them give the specific names for the stages: germinate, seed, seedling,  4. Project a [picture of the grass in a yard](https://www.saferbrand.com/media//articles/images/856/green_lawn_shutterstock_71264710.jpg). Ask them, “What can you tell me about this picture and the plant?” Have them list all they know about grass. Write the information on the SmartBoard. Have them think about the life cycle, ecosystem, habitat, seed dispersal, etc.  5. Explain to the students that will be examining a marine plant very similar to grass today. If needed, remind them what marine means. Ask the student to think about a plant that grows in or near the water.  6. Project a picture of [eel grass](https://www.google.com/imgres?imgurl=http%3A%2F%2Fs1.thingpic.com%2Fimages%2F3Q%2FR1SaFaS8iw3TCRHS2MVuyYFh.jpeg&imgrefurl=https%3A%2F%2Fwww.thinglink.com%2Fscene%2F598279638317268992&tbnid=kzqFXEZx9O-l-M&vet=12ahUKEwjx0qH2oe7qAhVriOAKHQp0BuYQMyggegUIARCRAg..i&docid=avUI_sASVtz1xM&w=750&h=525&q=eelgrass&ved=2ahUKEwjx0qH2oe7qAhVriOAKHQp0BuYQMyggegUIARCRAg) onto the screen. Ask them, “What can you tell me about this picture?” Write the information on the SmartBoard. Have them think about the life cycle, eco-system, habitat, seed dispersal, etc.  7. Compare the yard grass to the eel grass.  8. Ask the questions: What does eel grass need to grow? How does eel grass support its ecosystem?  9. Project the [life cycle pictures of eel grass](http://www.seagrassli.org/ecology/eelgrass/life_history.html) on the board and with the students have everyone fill out an empty [Life Cycle diagram](https://docs.google.com/presentation/d/11pxc_z8xwde3uyJ_PUs2MfCp9Qc2IMiHU58auKbYeg8/edit?usp=sharing) with drawings, labels and stages.  10. Have the students explain how the cycle works. Lead the students through each picture. \*Make special note of how long each life stage lasts as the students will need that for lesson 4. |
|  | VIRTUAL ACTIVITY  **Activity: How can we help eel grass? Explain to the students that eel grass is dying in many harbors. See if they can come up with reasons why the grass is dying. Possible answers: humans, pollution, weather, animals, etc.**  **Watch the video from the Buzzards Bay Coalition:** [**https://www.youtube.com/watch?v=DvTfgfgHd6Y**](https://www.youtube.com/watch?v=DvTfgfgHd6Y)  **Complete the experiment with clean water and cloudy water (see instructions in resources)** [**https://kids.nationalgeographic.com/explore/books/how-things-work/water-wonders/**](https://kids.nationalgeographic.com/explore/books/how-things-work/water-wonders/) |
| **IN CLASS** | VIRTUAL ALTERNATIVE |
| **Lesson Closing: (20 minutes)**  **Activity: How can we help eel grass? Explain to the students that eel grass is dying in many harbors. See if they can come up with reasons why the grass is dying. Possible answers: humans, pollution, weather, animals, etc.**  **Watch the video from the Buzzards Bay Coalition:** [**https://www.youtube.com/watch?v=DvTfgfgHd6Y**](https://www.youtube.com/watch?v=DvTfgfgHd6Y)  **Complete the experiment with clean water and cloudy water (see instructions in resources)** [**https://kids.nationalgeographic.com/explore/books/how-things-work/water-wonders/**](https://kids.nationalgeographic.com/explore/books/how-things-work/water-wonders/) | **Lesson Closing (Zoom): (10 minutes)**  1. Check in with the students.  2. Have them explain how we can help protect eel grass. |
|  | **EXPLORE OUTDOORS:**  With permission from an adult you live with, take a shovel and dig a small section of grass from your yard. Pick an area along the border where it won’t be noticed. Examine the grass. How do the roots run? Are there weeds in with the grass? Are there any bugs? What are they doing? Write down your observations. |

**Lesson 4: Comparing Plants and Animals**

|  |  |
| --- | --- |
| **Overview of the Lesson:** In this lesson, the students will use the information from the previous three lessons to compare and contrast the life cycles of animals and plants. The students will use the diagrams from the previous lessons to analyze the difference between animal and plant life cycles.  **Time (minutes): (45-60 minutes)** | |
| **Standard(s):**  MA STE Standards: 3-LS1-1  Next Generation Science Standards: 3-LS1-1  Ocean Literacy Principle: 5-d, i | |
| **Essential Question(s):**   * How are plant and animal life cycles similar? * How are plant and animal life cycles different? | |
| **Science Objectives:**   * The students will be able to analyze the life cycles and stages of an animal and plant. * The students will be able to compare and contrast the life cycles. | |
| **Language Objectives and/or Targeted Academic Language:**   |  |  |  |  | | --- | --- | --- | --- | | **compare** | **contrast** |  |  | | |
| **Anticipated Student Preconceptions/Misconceptions (optional)** | |
| **Instructional Materials/Resources/Tools:**  SmartBoard/Chart paper  Computer/Internet  Blank Venn Diagram | |
| **Assessment:**  Completion of a life cycle diagram.  Teacher observation | |
| **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](https://www.youtube.com/playlist?list=PL1CGd4Scv4GICVRODGA8RRvzocNN1lL8H) 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. As a followup activity, you may want to view portions of [webinar 38, “The Wonderful World of Plankton: the Tiny Animals of the Sea”](https://www.youtube.com/watch?v=P3p0pLDw8Kc&list=PL1CGd4Scv4GICVRODGA8RRvzocNN1lL8H&index=38). You can view larval forms of various marine animals and even have your students participate in the matching game on the video. | |
| **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 the information from the previous three lessons to compare and contrast the life cycles of animals and plants. The students will use the diagrams from the previous lessons to analyze the difference between animal and plant life cycles. | |
| **IN CLASS** | VIRTUAL ALTERNATIVE |
| **Opening/Engagement: (10-15 minutes)**   1. Review the 4 stages of an animal’s and plant’s life cycle from the previous 3 lessons. 2. Have the students name the stages of each life cycle. | **Independent Assignment: (10-15 minutes)**  1. Before the students meet with the teacher, put all of the student animal life cycle diagrams on padlet or a similar program.  2. Have the students look at a classmate’s life cycle diagram and look for 3 similarities and 3 differences. Have them share their observations on google classroom. |
| **IN CLASS** | VIRTUAL ALTERNATIVE |
| **During the Lesson: (20-25 minutes)**   1. **Activity: In Google Slides - Using their animal and plant life cycle diagrams from activity 2 and 3, have the students make a** [**Venn Diagram**](https://docs.google.com/presentation/d/1izI_-szy7t8XIqPc3tRqjFwPu9nbmflY6ovdYhNIM8g/edit#slide=id.p) **comparing the two. They may want to look up actual pictures of the life stages to use on their google slide. \*Make sure they include the length of time each stage takes for comparison purposes. Have them list 2 similarities and 2 differences between the plant and animal life cycles.** | **Meet with the Teacher (Zoom): (10-15 minutes)**   1. Review the 4 stages of an animal’s and plant’s life cycle from the previous 3 lessons. 2. Have the students name the stages of each life cycle. |
|  | VIRTUAL ACTIVITY   1. **Activity: In Google Slides - Using their animal and plant life cycle diagrams from activity 2 and 3, have the students make a** [**Venn Diagram**](https://docs.google.com/presentation/d/1izI_-szy7t8XIqPc3tRqjFwPu9nbmflY6ovdYhNIM8g/edit#slide=id.p) **comparing the two. They may want to look up actual pictures of the life stages to use on their google slide. \*Make sure they include the length of time each stage takes for comparison purposes. Have them list 2 similarities and 2 differences between the plant and animal life cycles.** |
| **IN CLASS** | VIRTUAL ALTERNATIVE |
| **Lesson Closing: (20 minutes)**  1. View completed slides | **Lesson Closing (Zoom): (10 minutes)**  1. Check in with students.  2. Have students present their slides. |
|  | **EXPLORE OUTDOORS:** Find a plant and animal outside your home that are in the same life stage. Observe them both, draw them both, and list 2 similarities and 2 differences between the 2. |

**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=PL1CGd4Scv4GICVRODGA8RRvzocNN1lL8H>

Epic Books - [https://www.getepic.com/](https://www.getepic.com/app/read/52055)

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

**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:**

Life Cycle Video - <https://www.youtube.com/watch?v=7hSnpkGyXx4&t=4s>

Blank Life Cycle Worksheet - <https://docs.google.com/presentation/d/11pxc_z8xwde3uyJ_PUs2MfCp9Qc2IMiHU58auKbYeg8/edit#slide=id.p>

Index Card Picture Sheets - <https://drive.google.com/file/d/1C092_s7BpUMo0FSmlhZ6PvddnGo6Fjbp/view?usp=sharing>

Tomato Plant Stages - <https://media1.thehungryjpeg.com/thumbs2/800_3611138_jfwxhsxdwlc5wt0o8w5i7sserlkyjnnp4k17921z_tomato-plant-growth-stages.jpg>

**Lesson 2:**

Animal Lifecycle - <https://www.youtube.com/watch?v=ivx6w56Zad4>

Marine Animals I Have Seen Worksheet - <https://docs.google.com/document/d/1yJ1f8_YXl9pLVKgPCPmpEMdHEM7__5GW5GFCHHp5Z3w/edit?usp=>

sharing

# NOAA Live! Webinar 13: [Leaping for Atlantic Salmon](https://www.youtube.com/watch?v=0YEk0_Ku_tI&list=PL1CGd4Scv4GICVRODGA8RRvzocNN1lL8H&index=14&t=925s) - 11:21-15:15

NOAA Live! Webinar 15 - [Swimming Upstream with River Herring](https://www.youtube.com/watch?v=uONrDwin5K0&list=PL1CGd4Scv4GICVRODGA8RRvzocNN1lL8H&index=15) - 21:20 - 25:51

# NOAA Live! Webinar 23: [Winged Ambassadors: Ocean Travelers](https://www.youtube.com/watch?v=QvfkTctb3zs&list=PL1CGd4Scv4GICVRODGA8RRvzocNN1lL8H&index=23) - 26:50 - 31:37

NOAA Live! Webinar 26 - [The Life of Hawaiian Bonefishes](https://www.youtube.com/watch?v=VYJ71GR7aVc&list=PL1CGd4Scv4GICVRODGA8RRvzocNN1lL8H&index=26) - 35:14-38

Bonefish Activity: H[abitat and life cycle activity](https://www.fisheries.noaa.gov/resource/educational-materials/habitat-mapping-follow-oio-throughout-their-life-cycle)

NOAA Live! Webinar 29 - [The Amazing Story of the Horseshoe Crab](https://www.youtube.com/watch?v=AWOkAIZxdW8&list=PL1CGd4Scv4GICVRODGA8RRvzocNN1lL8H&index=29) - 27:50 - 31:29

# NOAA Live! Webinar 38 - [The Wonderful World of Plankton: the Tiny Animals of the Sea](https://www.youtube.com/watch?v=P3p0pLDw8Kc&list=PL1CGd4Scv4GICVRODGA8RRvzocNN1lL8H&index=38) - 49:07 - 51:50

Blank Life Cycle Worksheet - <https://docs.google.com/presentation/d/11pxc_z8xwde3uyJ_PUs2MfCp9Qc2IMiHU58auKbYeg8/edit#slide=id.p>

Animal pictures of each animal featured in the above NOAA Live! Clips for each student to use as a label for their life cycle diagrams. Coloring pages to send home are also included. <https://drive.google.com/drive/folders/1cUPgQ4wNCHKPvvKXRcgJJxGH8l81HMJB?usp=sharing>

**Lesson 3:**

Label the structure of a plant - <https://www.worksheetplace.com/mf_pdf/Label-The-Plant-Parts.pdf>

Blank Life Cycle Worksheet - <https://docs.google.com/presentation/d/11pxc_z8xwde3uyJ_PUs2MfCp9Qc2IMiHU58auKbYeg8/edit#slide=id.p>

Buzzard’s Bay Coalition eel grass video - <https://www.youtube.com/watch?v=DvTfgfgHd6Y>

Picture of grass - <https://www.saferbrand.com/media//articles/images/856/green_lawn_shutterstock_71264710.jpg>

Picture of eel grass - <https://www.thinglink.com/scene/598279638317268992>

Life cycle of eel grass - <http://www.seagrassli.org/ecology/eelgrass/life_history.html>

Make a Water Filter - <https://kids.nationalgeographic.com/explore/books/how-things-work/water-wonders/>

**Lesson 4:**

Blank Venn Diagram <http://www.readwritethink.org/files/resources/lesson_images/lesson378/venn.pdf>

Blank Venn Diagram - <https://docs.google.com/presentation/d/1izI_-szy7t8XIqPc3tRqjFwPu9nbmflY6ovdYhNIM8g/edit#slide=id.p>

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

Detail the performance assessment and include any rubrics or resources