



What is Algae? Lesson Plan

Grade Span	6-8th Grade
Time Span	2 days (70 minute classes) to 2 weeks depending on which activities you choose to do.
Standards	<ul style="list-style-type: none"> • MS-LS 2-1 Analyze and interpret data to provide evidence for the effects of resource availability of organisms and populations of organisms in an ecosystem. • MS-LS 2-2 Construct and explanation that predicts patterns of interactions of organisms across multiple ecosystems. • MS-LS2-3 Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem. • MS-LS2-4 Construct and argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations. <p>Practice Standards:</p> <ul style="list-style-type: none"> • Analyzing and Interpreting Data • Constructing Explanations and Designing Solutions • Developing a Model • Engaging in Argument from Evidence • Obtaining, Evaluating, Communicating Information • Using Mathematics and Computational Thinking
Focus Question	Where does algae come from and how does it affect the ecosystem (especially intertidal zone)?
Overview	Students will be introduced to algae and research the different kinds. Students then will make algae in the classroom and take a field trip to see and observe macroalgae.
Objectives	<p>Students will be able to:</p> <ul style="list-style-type: none"> • Describe light waves and where they come from. • Write the equation of photosynthesis. • Explain how differences in light interactions and food will impact the growth of algae. • Explain how these impacts affect food webs especially in the intertidal zones.



Materials Needed	<p>BioMara Lesson Plan for "What is Algae?"</p> <p>Algae in a Bottle Lesson Plan</p> <p>Algae Colorations Scale</p> <p>It is suggested to download the ALGAE lesson from Clarendon Learning (it's free): https://clarendonlearning.org/?s=algae</p>
Video Material	<p>Amazing Algae Facts: https://www.youtube.com/watch?v=xsLbvRhznM</p> <p>What is Algae: Definitions, Characteristics, and Examples: https://www.youtube.com/watch?v=ms962kovV6M</p> <p>4 Ways Algae is Awesome: https://www.youtube.com/watch?v=agWS8MH6voM</p>
Vocabulary	<ul style="list-style-type: none"> • Algae • Microalgae • Macroalgae • Photosynthesis • Holdfast • Blade • Frond • Stipe • Thallus • Mid-rib • Air-bladders • Diatoms • Dinoflagellates • flagella • Algal Blooms • Flower • Stem • Roots • Leaves
Teacher Prep	<p>Read over: BioMara Lesson Plan for "What is Algae?"</p> <p>Read and Gather materials if doing Algae in a Bottle Lesson Plan</p> <p>The Great Algae Race</p>
Background	<p>Under the right conditions algae can be your friend or your enemy. Algae can be used as an alternative energy source like biofuels and can also “bloom” causing “Red Tide”, which can harm the shellfish industry and other living organisms in water ecosystems including the tidal habitat.</p> <p>The following: Waves and Wave like Motion has background information and thinking points about waves.</p>



Procedure

Engage:

1. Show students a 2:33-minute video, "Energy 101: Algae-to-Fuels," at <https://www.energy.gov/eere/videos/energy-101-algae-fuel>.
2. Break students into groups of 3-4 and give them a large sheet of white paper (you could use white boards or their notebooks).
3. As students to brainstorm what they know about algae.
4. Come back together and discuss answers that students had.

Explore:

Begin with [BioMara Lesson Plan for "What is Algae?"](#) (Taken right from this lesson)

1. Lesson 1: What is Algae?
 - a. Activity 1: Describe the structure of a macroalgae
 - b. Activity 2: Compare a macroalgae to a flower
 - c. Activity 3: Describe the two different varieties of algae by providing details about the colours of macroalgae and the two different varieties of microalgae.
 - d. Activity 4: Crossword review
 - e. Activity 5: Measuring different macroalgae
2. Lesson 2: How do Algae grow?
 - a. You could either do this lesson or you could incorporate: [Algae in a Bottle Lesson Plan](#) or [The Great Algae Race](#) as a more indepth way of growing algae.
 - b. Students could make their own question and try to answer it with the growing experiment OR
 - c. Students could follow your suggestions and do a prescribed activity OR
 - d. You could do one as a whole class demo and come back to it every class to record the data.

Explanation:

1. Take your students on a field trip to the ocean or local pond and look for algae.
 - a. Using [Acadia National Park's Intertidal Flora](#) have students fill in the [data collecting sheet](#).
 - b. Have students take pictures of the algae and try to identify what types of algae are around them.
 - i. If students have SEEK App on their ipads or phones students could take a picture and identify.
2. Either back in the classroom or out in the field students should be making connections with where algae is in the intertidal zone and the amount of light, amount of exposure, and temperature play a role in the growth of the algae.



If you can't get out to the water take a virtual Field Trip:

[Algae, Great Lakes Now Virtual Field Trip](#)

[New England Aquarium Growing Algae for their animals](#)

Extension:

[*Harmful Algae Blooms Pollute U.s Lakes*](#)

[*Toxic Algae Blooms*](#)

[*Harmful Algae Bloom \(HAB\) Identification: Tips and Tricks*](#)

[*Find your Plankton Activity from ANP Website*](#)

Evaluate

Formative Assessment:

Crossword puzzles, fill-ins, word scrambles, labeled sketches from "What is Algae?" Lesson plan.

Summative Assessment:

Using the Tide Pool Hangout page in this lesson:

https://darkwing.uoregon.edu/~ecostudy/elp/ee_marine_07/pdfs/christopher.pdf students should be able to label the tide pool levels and draw organisms that live in those levels, including algae.



What is Algae? Student guide

(Are there any ANP drawings/sketches explaining the layers of the intertidal zone that are free to use?)

On your outing today your job is to be searching for algae. Remember algae can be different colors. Please be careful, watch your step, the rocks can be slippery. Respect the animals and organisms living around the rocks. Use the [Acadia National Park's Intertidal Flora Guide](#) to help you figure out what you are seeing.

Name of Algae	Picture (You can take a picture and upload it later) or sketch of the algae.	What is the color?	What is the size?	Which zone did you find the algae in? (Spray, High Tide, Middle Tide, Low Tide)	Any observations? (Leaves are segmented, leaves split in 2, etc.)	What organisms did you see living around this algae? (crabs, periwinkles, limpets, etc.)