

OVERVIEW

At the beginning of the Water Quality Unit, students are asked to observe their school grounds – mapping where water comes from, where it goes, any pollution left on the ground, and more. Based on their observations, discussions, and their review of the one-page information sheet focused on water quality, students develop ideas about what might be happening on their campus, and what they want to investigate further. Student groups come up with a testable question, and set up an investigation that includes data collection and relates to water quality.



While collecting data, students continue to build content knowledge and context with more readings relating to water ecosystems, including watersheds and their biotic and abiotic factors, the producers, consumers, and decomposers of freshwater biomes and how water flowing across their campus contributes to an ecosystem’s ability to support organisms. After making observations and taking data, students present their findings and their evidence-based conclusions to the class. Students demonstrate what they have learned by creating a diagram of the biotic and abiotic factors of a freshwater ecosystem, and describe how human activities affect the ability of those factors to thrive. Then, students reflect on what they have learned and share their thoughts through the writing of a news article.

In the final step of the Water Quality Unit, students use their reflections to make informed choices and develop a service project to help their community. As a class, or in student groups, the Water Quality Project workbook is used to guide students through project development and follow through.

California Grade 6 Standards

The unit lessons are designed to help students master the following standards:

Ecology – Life Science Strand

- 5. Organisms in ecosystems exchange energy and nutrients among themselves and with the environment.
- c. Students know populations of organisms can be categorized by the functions they serve in an ecosystem.
- d. Students know different kinds of organisms may play similar ecological roles in similar biomes.

Learning Objectives

Learning objectives in the context of the Environmental Principles and concepts.

Students will:

- Give examples of the functions (producer, consumer, and decomposer) populations of organisms serve in an ecosystem.
- Identify humans as consumers within ecosystems.
- Describe the effects of human practices on the transfer of matter through natural systems.
- Recognize different biomes.
- Identify the characteristics of various biomes.
- Provide examples of different organisms playing similar ecological roles (herbivores, carnivores, omnivores, and decomposers) in similar biomes.

California Grade 6 Standards

- e. Students know the number and types of organisms an ecosystem can support depends on the resources available and on abiotic factors, such as quantities of light and water, a range of temperatures, and soil composition.

Learning Objectives

- Identify abiotic factors that affect ecosystems.
- Classify components of ecosystems as either living (biotic) or non-living (abiotic).
- Explain the effects of changing biotic and abiotic factors on an ecosystem (e.g., the effects of changing; quantities of light or water, and soil composition on plant growth; range of temperatures on the species composition of animals and plants).
- Provide examples of how human practices and rates of consumption affect the biotic and abiotic components (e.g., the availability of resources) in a natural system, thus influencing the number and types of organisms an ecosystem can support.

Investigation and Experimentation

- 7. Scientific progress is made by asking meaningful questions and conducting careful investigations. Students should develop their own questions and perform investigations.
 - a. Develop a hypothesis.
 - b. Select and use appropriate tools and technology to perform tests, collect data, and display data.
 - c. Construct appropriate graphs from data and develop qualitative statements about relationships between variables.
 - d. Communicate the steps and results from an investigation in written reports and oral presentations.
 - e. Recognize whether evidence is consistent with a proposed explanation.

UNIT IMPLEMENTATION IDEAS

Work with another grade level (4th – 6th) or classroom to complete parts of the Unit.

- Choose specific areas of the school to conduct the Schoolyard Review. Get together and compare data and maps.
- Have students partner across grade levels to conduct the Schoolyard Review.
- Have classrooms share their observations for increased data collection and to check validity.
- Have groups partner with groups from another class to conduct their investigations, sharing the time in gathering data. Combine data for their conclusions.
- Create or share a service learning project.