

#1. Water Characteristics

Summary: In this module you will learn what water is, what makes it unique, and how it is important in global climate issues.

Goals: By the end of this module you will be able to describe the unique properties of water and why those are important.

Sacred Water, a Native perspective. Check it out:

<https://editions.lib.umn.edu/openrivers/article/why-is-water-sacred-to-native-americans/>

Required readings:

General Introduction to the properties of water -- https://www.usgs.gov/special-topic/water-science-school/science/facts-about-water?qt-science_center_objects=0#qt-science_center_objects

More detailed information about the chemical and physical properties of water -- https://www.usgs.gov/special-topic/water-science-school/science/water-properties-information-topic?qt-science_center_objects=0#qt-science_center_objects Review each of the links (found on left-hand side of the web page) in the sub-headings called “Physical Water Properties” and “Chemical Water Properties”

Supplemental Content (review in class or assign directly):

Videos on the properties of water <https://www.youtube.com/watch?v=z5Vm56Pu4hU> and https://www.youtube.com/watch?v=HVT3Y3_gHGg

Key Vocabulary: density, universal solvent, pH, cohesion, adhesion, electrical conductance, heat index & specific heat, surface tension, salinity, groundwater

Assessment Tools:

True/False Quiz on Properties of Water: <https://water.usgs.gov/edu/activity-tf-properties.html>

Discussion Questions (can be used in classroom or for on-line discussion board):

- Why does ice float? (Answers should include a discussion of density.)
- San Jose, California and St. Louis, Missouri are at roughly the same latitude. Which city is likely to have more extreme temperatures? Why? (Answers should include a discussion of specific heat/heat capacity.)
- What are some ways in which water temperature can affect every day activities in the lives of other species and your family?
- Why is the ocean salty? & just how salty is it?

Written Plan: World Water Day is an annual observance, typically in March, that highlights the importance of freshwater around the globe. Write a plan or proposal for a meaningful way to mark this day in your community in 2021. <https://www.worldwaterday.org/>

Module 1 Lab Activity

Write a “Lab Report” for either (1) the Antarctic Landform Ice Melt experiment shown in this YouTube video <https://www.youtube.com/watch?v=XK2aWindhWg> OR for (2) the Sea Ice vs Land Ice experiment shown in this video <https://www.youtube.com/watch?v=3pCzByTysY4> OR for (3) this demonstration of impacts of melting ice <https://www.youtube.com/watch?v=IDZWWcAfn-c> NOTE: Instructor can carry out the experiments via video instruction (live-streamed or recorded), or students can conduct the studies at home with readily available supplies which can be provided in take-out studykits, or the instructors can provide results data for students to use in their lab reports.

Follow the IMRAD method to prepare your lab report. This resource shows how to write a good labreport with IMRAD: <https://writingcenter.unc.edu/tips-and-tools/scientific-reports/> Note: this resource also shows the correct way to cite reference materials.

Follow-up: Each student should share a short summary of their conclusions with classmates (either during a live discussion, recorded statement posted to class site, or in a discussion post).