



Arctic Science: Sea Ice Algae

GRADES 7 - 10

LESSON DESCRIPTION

Arctic Science Day is an experience for Grade 7-12 students offered each winter at FortWhyte Alive with workshops led by University of Manitoba's Centre for Earth Observation Sciences. This activity is taken from 2021's virtual day and helps students to understand the importance of Arctic sea ice as an ecosystem.

SUGGESTED CURRICULUM LINKS

Science: 7-1-01, 7-1-03, 7-1-14, 7-2-03, 7-2-04, 8-4-03, 8-4-18, S2-1-01, S2-1-02, S2-4-01, S2-4-07

OTHER RESOURCES

[Expedition Churchill \(Arctic Research e-book\)](#)

LESSON

Investigate the differences between salt water ice and freshwater ice, and the habitat that sea ice can provide for the primary producers (algae) in the Arctic food chain.

Materials

- Salt water (3.5g table salt / 100mL water)
- Freshwater
- Ice cube trays
- Blue food colouring (can be thinned with rubbing alcohol)
- Shallow plastic dishes for the ice cubes

Procedure

- Use [this video](#) and [this video](#) to spark interest in the importance of ice algae. Have students place a drop of dye on the saltwater and freshwater cubes and observe what happens.

- The dye will spread through the saltwater ice, while it will just run off the freshwater ice.
- This demonstrates the presence of brine channels in sea ice which can host entire microbial ecosystems.
- While fresh sea-ice still forms every year, multi-year sea ice in the Arctic is disappearing as a result of climate change, and ice density and extent are reducing. If multi-year sea ice is habitat for primary producers such as algae, what is one way that climate change can affect the ecological pyramid in the Arctic Ocean?

Extension: Use this opportunity to teach about the differences in freezing temperatures between salt-water and freshwater. Use spike thermometers to take the temperature of the frozen cubes. This applies to further understanding of Arctic ocean dynamics, as melting ice contributes freshwater to the ocean which sits as a lens on top of the more dense saltwater.