

BIOLOGY 30: ANATOMY & PHYSIOLOGY

ACCLIMATION TO WINTER

OUTCOME

- BI30-OL2 Compare the anatomies, physiologies and behaviors of multicellular organisms including protists, fungi, plants and animals.

BACKGROUND KNOWLEDGE

- Students can begin to think about the evolutionary pressures that are exerted by wintery climates by investigating “SCREW” vectors. Here is a brief explanation from the Saskatchewan Environmental Society.
- This document contains a very thorough outline of physiological adaptations of plants to winter conditions. This resource from Let’s Talk Science is more student-friendly and concise.
- This document details the chemistry of various biological adaptations (in both plants and animals) to freezing conditions.

ACTIVITY: TREE OBSERVATIONS

1. Visit a nearby park and choose one deciduous tree and one coniferous tree to observe.
2. Through journaling, photography, sketching, or other means, begin to document possible adaptations to the SCREW vectors (snow, cold, radiation, energy, and wind). In addition to observations, record questions and wonders related to plant adaptations to winter.
3. Once students have had adequate time to record observations, take the class on a walking tour of all of the trees that they observed, and ask them to share their observations and wonders.
4. Choose one feature of a tree that you observed, and research the physiological or anatomical features that allow it to survive through the winter. The documents in the “background knowledge” section might be a good starting point for research.



MATERIALS

- Clip Clipboards
- Writing utensils
- Optional; magnifying lenses

DID YOU KNOW?

Researching cold-weather adaptations in prairie organisms on the internet can be challenging! Don’t be shy to reach out to elders, U of S researchers, and Meewasin staff as primary resources.

EXTENSIONS

1. **BI30-OL2 Compare the anatomies, physiologies and behaviors of multicellular organisms including protists, fungi, plants and animals.** Design an experiment that helps you understand the relationship between environmental conditions and dormancy. Use weather data from Environment Canada regarding moisture, daylight, and temperatures, and observe changes in nearby trees that give us clues about this relationship (leaf abscission, bud flushing, running sap, etc).

ESSENTIAL QUESTIONS

1. How does a cold climate impact the anatomy, physiology, and behavior of various organisms?
2. What is the advantage of leaf drop/leaf retention?

HOME CONNECTION

- Interview the people in your household about the “signs of winter” or “signs of spring” that they recognize. If students are new to winter climates, investigate the signs of seasonal changes that they are familiar with (for example rainy season/dry season). Investigate the physiological processes that these phenomena are connected to.