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## An adaptation of the Data Nugget “Winter is coming! Can you handle the freeze?”

By Liz Martin



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### Module Description:

This resource is an adaptation of a Data Nugget that features real research from scientist [Doug Schemske at Michigan State University \(MSU\)](#). Doug and his research team carry out experiments with the plant species Mouse-ear Cress, or *Arabidopsis thaliana*. In this two-part activity, students use data collected by Doug and his research team to make predictions, create graphs, and state evidence-supported scientific claims. In part 1A, students make predictions about the outcome of Doug’s reciprocal transplant experiment, which he used to test whether *Arabidopsis* is locally adapted to its environment. In part 1B, students examine data from Doug’s freeze-tolerance experiment to see whether this trait was driving local adaptation.

## Teaching Setting:

This resource was used in an online, introductory, non-majors botany class as part of a unit on natural and artificial selection in plants. One learning objective of the unit was for students to describe similarities and differences between artificial and natural selection. The Data Nugget provided students an example of research looking at natural selection, which they could then compare to the process of artificial selection in agricultural crops.

The original Data Nugget is designed for use in a variety of teaching settings, including advanced high school or college undergraduate courses, and includes 3 different student versions that differ by the level of graphing skills that you would like students to practice.

## QUBES Citation:

Martin, L. (2018). [Winter is Coming! Can you handle the freeze?. LDC-Data Nuggets FMN \(2017\)](#), QUBES Educational Resources. [doi:10.25334/Q4KQ4C](https://doi.org/10.25334/Q4KQ4C)

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## Related Materials and Opportunities:

Data Nuggets are free classroom activities, co-designed by scientists and teachers. They are an innovative approach to bring contemporary research and authentic data into the

classroom. Data Nuggets include a connection to the scientist behind the data and the true story of their research process. Data Nuggets give students practice working with “messy data” and interpreting quantitative information. Students are guided through the entire process of science, including identifying hypotheses and predictions, visualizing and interpreting data, making evidence based claims, and asking their own questions for future research. Learn more about Data Nuggets by visiting <http://datanuggets.org/> or the [Data Nuggets group on QUBES](#).

The Data Nugget “[Winter is Coming! Can you handle the freeze?](#)” was adapted for different teaching settings by participants in the [Life Discovery Conference - Data Nuggets \(Fall 2017\) Faculty Mentoring Network \(FMN\)](#), which was sponsored by the Ecological Society of America (ESA), Data Nuggets, and the Botanical Society of America (BSA). In addition to the adaptation featured here, there are 3 other adaptations of this resource available on QUBES that were used in different teaching settings, including:

- an AP Biology course ([view adaptation](#))
- a Team Based Learning Introductory Biology course ([view adaptation](#))
- an Elementary Education Science Methods course for Elementary Teachers ([view adaptation](#))

Do you have an ecology teaching resource to share? The ESA Education Section is sponsoring presenters at the [11th Resources for Ecology Education – Fair & Share \(REEFS\)](#), which will be held on Sunday, August 11, 2019, 12:00 PM-5:00 PM at the 2019 ESA Annual Meeting in Louisville, Kentucky. Teaching ideas at all levels of development are welcome. For those who are developing a new activity, this is an opportunity for you to get immediate feedback. For those with tested activities, come share your teaching resource. We are especially looking for ideas that help advance the core concepts and competencies embodied in the [Four Dimensional Ecology Education\(4DEE\) Framework](#) and [Vision and Change in Undergraduate Biology Education](#). We welcome your participation as education leaders! To present a resource, please register by April 30, 2019. For information on REEFS and details for presentations, please visit: <https://www.esa.org/esa/education-and-diversity/reefs/>

*If you adopt and adapt this module, you are highly encouraged to share your adaptation back with the QUBES community using the QUBES Resources System for sharing Open Education Resources.*

QUBES on Social Media



QUBES is a community of math and biology educators who share resources and methods for preparing students to use quantitative approaches to tackle real, complex, biological problems.

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P.O. Box 126, Boyds, MD 20841

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