



Classroom Teacher Preparation

Life Sciences 6: Population Changes

Please use the following to prepare for the next SfS lesson.

Description:

In this lesson, students play an Oh Deer! game to learn about population dynamics. In this game, students observe the natural fluctuation of a population and the effect of limiting factors on population levels. After the game, students graph their data and analyze the effects of various limiting factors. Students discuss what defines the carrying capacity of a habitat and how carrying capacity may change over time. **This lesson requires enough space for the whole class to walk around.**

Lesson Objectives – SWBAT (“Students Will Be Able To...”):

3rd-8th

- Define carrying capacity and name some factors that limit population growth
- Model and graph population changes in a habitat

Disciplinary Core Idea (DCI)

LS2 Ecosystems: Interactions, Energy, and Dynamics - LS2.A. Interdependent Relationships in Ecosystems

- (3rd-5th) The food of almost any animal can be traced back to plants. Organisms are related in food webs in which some animals eat plants for food and other animals eat the animals that eat plants, while decomposers restore some materials back to the soil.
- (6th-8th) Organisms and populations are dependent on their environmental interactions both with other living things and with nonliving factors, any of which can limit their growth. Competitive, predatory, and mutually beneficial interactions vary across ecosystems but the patterns are shared.

Science & Engineering Practice (SEP)

Analyzing and Interpreting Data

- (3rd-5th) Compare and contrast data collected by different groups in order to discuss similarities and differences in their findings.
- (6th-8th) Analyze and interpret data to determine similarities and differences in findings.

Crosscutting Concept (CCC)

Cause and Effect

- (3rd-5th) Cause and effect relationships are routinely identified, tested, and used to explain change.
- (6th-8th) Cause and effect relationships may be used to predict phenomena in natural or designed system

Preparation:

Students should be familiar with the concepts of food webs and ecosystems.



Room Set Up for Activities:

This lesson requires enough floor space for all students to move freely from one side of the room to the other. If desks/tables cannot be moved aside to create enough floor space, the game can be played outside, in the multipurpose room gym/hallway etc., circumstances permitting. Please note that the activity may get a bit noisy.

Safety:

Students should be warned that they are walking always, never running.

Related Modules:

This lesson may be taught as part of a sequence or group of related modules on **Ecosystems & Human Impact**. Modules include:

Life Science 5: Food Webs – This module teaches the basics of food webs. Students first construct a food web model for a simplified Yellowstone ecosystem. They then consider what would happen to the ecosystem if the food web were disrupted by the removal of a native species and/or the introduction of an invasive species.

Life Science 4: Invasive Species – Students explore what it means for species to be native, non-native, or invasive by using a game-model with different fish species.

Anatomy/Physiology 11: Earthworm Dissection - Recycling Matter – This lesson allows students to explore the role of decomposers, the flow of matter, and the cycle of energy in an ecosystem through the dissection of a preserved earthworm.

Life Science 10: Sustainability - Fishing for Answers – This lesson uses a fishing game to explore the concepts of sustainability and the tragedy of the commons.

For other module sequences and groups, look here: www.sciencefromscientists.org/sequences

Standards Covered:

Please click the following link to our website to review the standards covered by this lesson, listed by state: www.sciencefromscientists.org/standards/

Lessons are matched to both national NGSS and local state standards.

After Our Visit:

Extend this lesson by playing ecosystem games or exploring a wolf-and-rabbit population simulation.

Access this Extension activity by visiting the Classroom Post found on our website at sciencefromscientists.org/cohorts. Use the name of your school/cohort and password to log in.

To help Evaluate, check out our Open Response questions online at sciencefromscientists.org/open-response-questions. They are freely available for all of our lessons for current teachers. Use the password supplied by your instructor to log in.

Additional Resources:

- Population Dynamics Featuring Deer (14:45) <https://www.pbs.org/video/natureworks-population-dynamics/>
- Biological Carrying Capacity (4:34): <https://www.youtube.com/watch?v=QI2ixJelxEU>
- Demonstration of the Oh Deer! Game (4:59): https://www.youtube.com/watch?v=G_79b-8y8vY