



Classroom Teacher Preparation

Anatomy/Physiology 11: Earthworm Dissection – Recycling Matter

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

Description:

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. After a brief introduction to the dissection procedure, students work in pairs to discover how the earthworm's simple, yet complete, digestive system plays a crucial role in the environment.

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

4th-8th

- Examine the external and internal anatomy of an earthworm and identify structures that help worms be efficient decomposers
- Recognize that earthworms are crucial to the cycling of matter and flow of energy in an ecosystem

Disciplinary Core Idea (DCI)

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.

LS2.B Cycles of matter and energy transfer in ecosystems

- (6th-8th) The atoms that make up the organisms in an ecosystem are cycled repeatedly between the living and nonliving parts of the ecosystem. Food webs model how matter and energy are transferred among producers, consumers, and decomposers as the three groups interact within an ecosystem.

Science & Engineering Practice (SEP)

Engaging in Argument from Evidence

- (3rd-5th) Construct and/or support an argument with evidence, data, and/or a model.
- (6th-8th) Construct, use, and/or present an oral and written argument supported by empirical evidence and scientific reasoning to support or refute an explanation or a model for a phenomenon or a solution to a problem.

Crosscutting Concept (CCC)

Structure and Function

- (3rd-5th) Substructures have shapes and parts that serve functions.
- (6th-8th) Complex and microscopic structures and systems can be visualized, modeled, and used to describe how their function depends on the shapes, composition, and relationships among its parts; therefore, complex natural and designed structures/systems can be analyzed to determine how they function.



Preparation:

This lesson may act as an introduction to dissection and/or a connection to understanding how matter is recycled and energy flows in an ecosystem; specifically, through decomposers.

We have prepared a *Dissection Letter for Parents* that can be distributed upon request. Please let your instructor know if you are interested. **Note:** For students not wishing to participate in the dissection, there is a virtual online tour of the earthworm at http://glencoe.mheducation.com/sites/dl/free/0078802849/383950/BL_14.html. Access to tablets or a computer with Internet access during class time would allow them to virtually review the material.

Room Set Up for Activities:

Students will work in pairs or trios at their desks or tables.

All materials, food, and drinks should be cleared from their work area before beginning the lesson. Desks should be cleaned following the dissection.

Safety:

Gloves are required. We use powder-free latex gloves by default, however latex-free gloves for an individual or whole class are available upon special request. **Please inform the instructor of a latex allergy before the lesson begins.**

The dissection procedure requires the use of sharp scissors and pins; therefore, safety glasses or goggles must be worn at all times during this activity. Hands should be washed immediately following the lesson.

Long hair should be pulled back and long sleeves should be pushed up.

Related Modules:

This lesson may be taught as part of a sequence or group of related modules on Ecosystems. 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.

Earth Science 14: Soil Properties – This lesson introduces students to the characteristics and formation of soil. Students will examine the color, texture, and field capacity of soil, and discuss the importance of soil for plant life.

Earth Science 13: Soil Nutrient Cycle – Students follow a multistep process to perform tests of the concentrations of the soil nutrients nitrogen, phosphorus, and potassium (NPK) and/or a test of soil pH.

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:

We recommend you visit <http://extension.illinois.edu/worms/> to learn more about worms and Herman's adventures for an Extension.

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:

- North Carolina ScienceNOW; Putting Decomposers to Work (6:11) <https://www.pbslearningmedia.org/resource/ffb84bb7-e9d2-4872-bb65-e4e0d377f45e/putting-decomposers-to-work/#.W4lAsZNKgxE>
- DragonflyTV; Worm Farm (4:10) <https://www.pbslearningmedia.org/resource/3daedfdc-edec-4c2e-b301-850cb5a8653e/3daedfdc-edec-4c2e-b301-850cb5a8653e/#.W4lA8ZNKgxF>