



Classroom Teacher Preparation

Life Sciences 4: *C. elegans*

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

Description:

In this lesson students are introduced to one of the most simple—yet powerful—model organisms, the microscopic roundworm *Caenorhabditis elegans* (*C. elegans*). Students will conduct a very simple controlled experiment to test the preference of *C. elegans* for different odors. With this chemotaxis test, students will be able to understand the basics of the sense of smell and visualize the nervous system in action. This lesson is intended for older (6th-8th grade) students. Due to the timing constraints of the experiment, this module requires a **minimum 60-minute class**.

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

6th-8th

- Familiarize themselves with the model organism *C. elegans*
- Visualize chemotaxis, one of the simplest behavioral responses
- Conduct a simple controlled experiment
- Collect and analyze experimental results

Disciplinary Core Idea (DCI)

LS1 From Molecules to Organisms: Structures and Processes – LS1.A Structure and Function

- (6th-8th) All living things are made up of cells. In organisms, cells work together to form tissues and organs that are specialized for particular body functions.

Science & Engineering Practice (SEP)

Asking Questions and Defining Problems

Preparation:

This lesson is an introduction to the topic.

AP19: *What's In My Head* is a recommended pre-requisite, so that the students are familiarized with the nervous system.

Room Set Up for Activities:

Students will be working in groups of 4-5 due to microscope availability. SfS only has 6 microscopes, which means that students will have to take turns. If your school has any *dissecting microscopes*, please bring them to class so that students can work in smaller groups, which is ideal.

Before our scheduled class: Please reserve 5-8 dissecting microscopes, if your school has them available. Flat tables with access to power outlets will be necessary for the microscope work. If using microscopes provided by the school, please set them up before class begins. If outlets in the classroom are not conveniently located, provide extension cords/power strips if possible.



Safety:

Students will be working with microscopic live animals. Even though this does not pose any safety concerns, students should wash their hands after class and clean their desks with the provided disinfectant wipes. All materials used during the activity will be disposed of in a biological waste container that we will take with us to properly discard.

Related Modules:

This module can be related to lessons regarding body systems, especially the **Nervous System**. Related modules include:

Anatomy/Physiology 19: What's in my Head? – This lesson is an introduction to the human nervous system, and focuses on the human brain and its functional units, the neurons.

Anatomy/Physiology 20: Learning and Memory – This lesson demonstrates how the brain learns to adapt to a new situation and how our brain is highly adaptable.

Standards Covered:

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

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

After Our Visit:

Extend this lesson by testing olfactory (odor) preferences through a fun and simple experiment.

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:

WGBH Videos and Activities: The PBS educational site is a great, free resource for educators but you must create an account to use the materials. The first time you log in to the PBS Learning Media website you will be asked to create an account and provide an email and password. Once you have logged in, select “keep me logged in” to avoid having to repeat the process.

- Interactive activity to learn about different model organisms:
<http://mass.pbslearningmedia.org/resource/hew06.sci.life.gen.modelorg/model-organisms/>

Other Resources:

- Brief introduction to *C. elegans* (video, 2:11): <https://www.youtube.com/watch?v=zjqLwPgLnV0>
- Harlem Shake worms (video, 0:29): <https://www.youtube.com/watch?v=BWCm20gXnEs>
- *C. elegans* movement (video, 5:27): <https://www.youtube.com/watch?v=GgZHziFWR7M>