



Classroom Teacher Preparation

Anatomy/Physiology 3: DNA Extraction

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

Description:

This lesson provides an introduction to the location and function of DNA in different cells. Students will critically think about the process of DNA extraction using a model and then each student will get to extract DNA from a strawberry (or other plant)! Afterwards, students will learn more about the similarities and differences between our DNA and other organisms' genetic content.

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

6th-8th

- Perform a DNA extraction and explain the significance of each step
- Identify DNA as the genetic code for almost all organisms

Disciplinary Core Idea (DCI)

PS1 Matter and Its Interactions – PS1.A Structure of Matter

- (6th-8th) The fact that matter is composed of atoms and molecules can be used to explain the properties of substances, diversity of materials, states of matter, phase changes, and conservation of matter.

Science & Engineering Practice (SEP)

Planning and Carrying Out Investigations

- (6th-8th) Conduct an investigation and/or evaluate and/or revise the experimental design to produce data to serve as the basis for evidence that meet the goals of the investigation.

Crosscutting Concept (CCC)

Structure and Function:

- (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:

Students should be familiar with the structure of a mammalian cell, specifically the nucleus and the cell membrane.

Room Set Up for Activities:

Students will be working individually or in small groups at desks or tables. A clear workspace will be necessary, as students will be working with chemicals.

Safety:

The isopropyl alcohol used in this lesson should not be inhaled or consumed.



Related Modules:

This lesson may be taught as part of a sequence or group of related modules on **Cells, Heredity/Biodiversity**, or **Forensics**. Other modules in these sequences include:

Anatomy/Physiology 1: Cells & Organelles – Students make a cell model to learn about the functions and interactions of a cell's organelles.

Anatomy/Physiology 2: Mitosis - This module teaches the basics of mitosis using plant root tips. Students learn to identify cells in the different stages of mitosis, as well as how to use a compound light microscope and (for classes with ample time) prepare a wet-mount slide.

Anatomy/Physiology 6: Blood Composition - This is an introductory lesson detailing the components of blood and highlighting the process and importance of blood typing. Students partake in a simulated blood typing activity (and if time and resources are available) examine blood cells under a microscope.

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 constructing edible DNA using gummies, licorice, and other candies.

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:

- DNA Building game (Flash required): http://www.nobelprize.org/educational/medicine/dna_double_helix/dnahelix.html
- What is a Gene? (4:57): <http://youtube.com/watch?v=5MQdXjRPHmQ>
- What is DNA and How Does it Work? (5:24): <http://youtube.com/watch?v=zwibgNGe4aY>