



Classroom Teacher Preparation

Anatomy/Physiology 21: Hair Identification

Description:

This lesson is an introduction to the concept of hair analysis. Students use the medulla pattern of different species to solve a mock crime. Students then use claim, evidence, and reasoning to explain their theories about the crime. With enough time, students may also use prepared hair slides or a sample of their own hair to observe under a microscope.

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

3rd-5th

- Identify the functions of hair
- Analyze microscopic images of hair from different mammal species to solve a mock crime

Disciplinary Core Idea (DCI)

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

- (3rd-5th) Organisms have both internal and external macroscopic structures that allow for growth, survival, behavior, and reproduction.

Science & Engineering Practice (SEP)

Analyze and Interpret Data

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

Preparation:

This lesson is an introduction to the topic of hair identification. It is not necessary but would be helpful if students were familiar with the word “**medulla**”, which is the core of a hair follicle. The medulla is used to identify a mammal to the species level.

Room Set Up for Activities:

Students will work in pairs at their desks.

Safety:

There are no safety precautions for this lesson.

Related Modules:

This lesson may be taught as part of a sequence or group of related modules on **forensics** or CSI. Modules include:

Anatomy/Physiology 3: DNA Extraction – Students 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).



Anatomy/Physiology 22: Fingerprinting – Students discover which type of fingerprint they have before investigating the various ways of leaving behind, collecting, and analyzing prints, including inking and dusting & lifting.

Chemistry 8: Design a Chromatography Experiment – Students consider what type of questions paper chromatography can be used to answer, and design and carry out at least one chromatography experiment. While the experiment is running, the students will participate in a discussion of chromatography and interpreting chromatograms

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 a virtual forensic investigations game that uses hair samples and other forensic evidence to solve a crime.

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:

- “Strands of Evidence” - Discusses how certain types of hair analysis can act as a “GPS tracking system” - <https://mass.pbslearningmedia.org/resource/arct14.sci.nvstrandev/strands-of-evidence/>
- “Hair Salon Fieldtrip” - Provides an overview of different hair types and why we should get haircuts - <https://mass.pbslearningmedia.org/resource/a9831ae3-bc06-43c6-9585-04a61176050a/hair-salon-field-trip/>
- “FBI: Inside the Crime Lab” - Forensic examiner explains his process after receiving samples for analysis - <https://mass.pbslearningmedia.org/resource/trace-evidence/fbi-crime-lab/>