Classroom Teacher Preparation

Anatomy/Physiology 22: Fingerprinting

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

Description:

Students learn how fingerprints are formed, the forms friction ridges take and the prints they can leave behind, before investigating the various ways of studying fingerprints. Students will experiment with fingerprint dusting, lifting, and inking, and will also practice analyzing prints.

Lesson Objectives – SWBAT ("Students Will Be Able To…"):

3rd-8th

- Appreciate that the fingerprint ridges on each individual's fingers are unique
- Identify patterns of fingerprints
- Use common fingerprinting techniques
- Understand the differences between the three ways of leaving fingerprints: plastic, patent, and latent

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.
- (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)

Analyzing and Interpreting Data

Preparation:

This lesson is an introduction to the topic. No previous experience with the topic is necessary to complete the lesson.

Room Set Up for Activities:

Students will share materials in small groups. There are enough supplies for 6 groups.

Safety:

There are no safety concerns for this lesson. Latex balloons and inkpads may be used in longer classes. The ink can stain clothing, so caution should be taken. If a student has an allergy to latex, please notify the instructor.

Related Modules:

This lesson may be taught as part of a sequence or group of related modules on **Forensics**. Other modules in this sequence include:

Anatomy/Physiology 3: DNA Extraction - Students extract a visible sample of DNA from fruit (strawberries or bananas).

Anatomy/Physiology 6: Blood Typing - This lesson introduces the components of blood and highlights the process and importance of blood typing. Students type simulated blood and may also look at blood smear slides under a microscope.

Chemistry 8: Paper Chromatography - Students will learn about chromatography in general and use paper chromatography to explore the composition of various inks. We begin with a discussion about chromatography and its various forms and explain how this powerful tool can help distinguish between two or more compounds.

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: http://www.sciencefromscientists.org/standards/

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

After Our Visit:

Extend this lesson by putting students' forensic skills to the test in "The Case of the Missing Robot", where they must identify the culprit's fingerprints and solve the 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:

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.

- Secrets of Scotland Yard Video (4:33) - http://mass.pbslearningmedia.org/resource/fd12b854-0440-45bd-b22c-f54d5bc3b23b/secrets-of-scotland-yard-part-9/
- Science City Forensic Science Video (3:53) - http://mass.pbslearningmedia.org/resource/city07.sci.engin.systems.hannaford/jennifer-hannaford/

Other Online Videos:

- How to compare fingerprints in detail (5:44) - http://youtube.com/watch?v=IrpTqKkgygA
- Bill Nye - Intro to Fingerprints (1:21) - https://www.youtube.com/watch?v=V98E1Zzm0EQ
- Importance of fingerprints in CSI (3:22) - http://youtube.com/watch?v=w7wUuRiMCuM1

Online Activities:

- Wonderville Fingerprinting Activity - Compare fingerprint patterns to identity the culprit: http://www.wonderville.ca/asset/fingerprint-activity
- Fingerprint Challenge: http://sciencespot.net/Media/FrnsScience/fingerprintchall.pdf
- Online CSI Forensic Games: http://forensics.rice.edu/en/For-Educators/Online-Activities.html
- PBS Whodunit? http://www.pbs.org/wgbh/amex/dillinger/sfeature/sf_whodunit.html