Unit 05: Medicine

Content Area: **Science**
Course(s): **Forensics**
Time Period: **Semester 1**
Length: **4 weeks**
Status: **Published**

Standards

SCI.HS.PS3.A	Definitions of Energy
SCI.HS.PS3.B	Conservation of Energy and Energy Transfer
SCI.HS.LS1.C	Organization for Matter and Energy Flow in Organisms
SCI.HS.LS1.C	Organization for Matter and Energy Flow in Organisms
	Obtaining, Evaluating, and Communicating Information
	Patterns
	Engaging in Argument from Evidence
	Analyzing and Interpreting Data
	Stability and Change

Enduring Understandings

1. Chemistry in the body does not stop after death, it only changes.

2. Evolution can occur to benefit local populations rather than just individuals.

3. Chemical reaction rates are "clocks" that allow many natural processes to be timed.

4. Temperature affects all chemical reactions and therefore influences all chemical "clocks."

Essential Questions

1. What evidence is available to the forensic investigator when examining a corpse?

2. If you were a forensic scientist and needed to catch a murderer, would you prefer a body and no crime scene, or a crime scene and no body?

3. What is death?

4. Does chemistry stop at death?

5. What are the main differences between the chemistry of life and the chemistry of death?

6. How can you use chemistry as a "clock" to establish times of death?

Knowledge and Skills

Knowledge:

1. Students will know how to describe the differences between the chemistry of death and the chemistry of life.
2. Students will know the steps of a forensic autopsy.
3. Students will know how to differentiate between livor mortis and rigor mortis.
4. Students will know how to describe the processes related to the development of rigor and relate them to anaerobic conditions like muscle cramping.
5. Students will know the processes that lead to relaxation of rigor.
6. Students will know how to explain the temperature dependence of establishment and passing of rigor.
7. Students will know how to estimate the time of death based on rigor mortis.
8. Students will know how to describe the physical processes that lead to livor mortis and fixing of livor.
9. Students will know how to use evidence from livor mortis to argue for a sequence of events occuring after death
10. Students will know how to use Newton's Law of Cooling to estimate time of death.
11. Students will know how to relate temperature to chemical reaction rates that govern the various processes that occur after death.
12. Students will know how to describe the life cycle and succession of insects that act as decomposers after death.
13. Relate size distributions of maggots and their stage of development and climatic data to time of death
14. Students will know how to describe the sequence of "clocks" that can be used to determine time of death.
15. Students will know how to explain the stages of decomposition and how characteristics of the body at each stage can assist investigators in determining time of death.
16. Students will know what features of the skull can be used to identify an unknown individual whose skeletal remains are found.
17. Students will know how to identify parts of the pelvic bone that can be used to determine biological sex.
18. Students will know how advancements in technology are able to help forensic anthropologists determine the identity of unidentified skeletal remains.
19. Students will know the class and individual characteristics of teeth which can be used to identify

human remains.

20. Students will know the pros and cons of utilizing bite marks in crime solving.

Skills:

1. Identify the manner, cause, and mechanism of death.
2. Calculate approximate time of death, given information about livor, rigor and algor mortis.
3. Illustrate the blowfly life cycle and explain how each stage of a blowfly's life cycle can assist forensic investigators in determining post mortem interval.
4. Design and construct an experiment that studies blowflies at their different life cycle stages.
5. Calculate the height of an unknown individual whose skeletal remains are found.
6. Utilize antemortem and postmortem x-rays to identify whether or not teeth are a match.

Assessments

https://docs.google.com/document/d/1wR7bQF-8AQoRrt0g4C3hKja0yjwDjC9_BiAmONWbTcI/edit

Modifications

https://docs.google.com/document/d/1ODqaPP69YkcFiyG72fIT8XsUIe3K1VSG7nxuc4CpCec/edit