



PLTW Virtual Learning

Medical Detectives

Lesson 19

April 30, 2020



7 & 8 Grade Medical Detectives

Lesson: April 30, 2020

Objective/Learning Target:
Lesson 19, Part 4

Students will be able to explain the different types of evidence used in forensic science to solve crimes.

Disclaimer: This lesson is optional for anyone who is uncomfortable with this topic.

Warm-Ups:

Quick Write:

You have learned a lot about forensic science and DNA evidence; but what happens if you do not have DNA evidence and you have to solve a crime?

1. How many other types of evidence can you name that can be used to solve a crime?
2. Why do we need more evidence than just the DNA to solve a crime?
3. What does it mean to be a forensic entomologist? What do they do?

Take a minute to write **WHAT YOU KNOW!**

[One Minute Timer](#)



Lesson Introduction/Background Information:

There are all types of different evidences used to solve crimes. We're going to be looking at some of these different types in this lesson. Looking at the "whole picture" is the focus of the forensic scientist.

Here are a few examples of different physical evidences that can be used: Drugs and toxic substances, paints, impressions such as (shoe prints, tire marks, bite marks), fibers, glass, plastics, soil, pollen, wood material, feather, bones and tool marks. For the person who loves to solve mysteries, the challenges are endless!

Another evidence finder can be insects and that's what forensic entomologist do. They study and work with insects to solve crimes and mysteries.

Watch the video [CSI Special Insects Unit: Forensic Entomology](#) to find out more and see how "bugs" can solve crimes.

****Lesson Disclaimer:** The video includes the discussion of insects used for determining the time of death and can be gory or upsetting. Please do not participate, or continue with this video, if it makes you or anyone else uncomfortable, or upset, in any way. Thank you!

Practice:



You've watched the video, now let's review some of the information.

There are 3 general areas of forensic entomology:

1. Urban - Work with solving insects in human dwellings crimes.
2. Stored Product - Work with the contamination of commercial products.
3. Medico-Legal - Read the signs of insects and the evidence they provide in murder mysteries.

Can you give an example for each one of these areas? Remember the mosquito on the wall that solved the murder mystery?

1. _____
2. _____
3. _____

Practice:



Insect Informants:

Through the science of forensic entomology, the study of insects associated with a corpse, we learn that cadaverous critters can tell us a great deal about a crime. As a body decomposes, certain insects and invertebrates colonize it in a sequential and measured rate. It's possible that after three days, insect evidence can often be the most accurate and sometimes the only method of estimating the elapsed time since death. Entomological evidence may also help determine how a person has died, or if a body has been moved or disturbed postmortem (after death).

Grain of Truth:

Pollen is definitely irritating to those who suffer from allergies; but when incorporated into forensics, it not only irritates criminals but also can implicate them. Forensic palynology is the science of analyzing pollen and spores to help solve cases. Pollen samples from a suspect's clothing, shoes, or vehicle, can point criminal investigators to a specific geographical location, prove or destroy alibis, and link a suspect to the scene of a crime. Who knew ... right?

<https://www.pbs.org/wnet/nature/crime-scene-creatures-introduction/301/>

Practice:



How Can Wood Be Evidence:

© Can Stock Photo

The structure and physical variations of wood can be as distinctive as a fingerprint and just as useful in solving a crime. Forensic wood anatomists are able to obtain important clues on both macro- and microscopic levels – from matching growth patterns in large pieces of lumber to analyzing the physical characteristics of a splinter-sized fragment.

The first and perhaps most famous case in which wood anatomy was used, in the court system, was to help solve a crime where the Lindbergh baby was kidnapped in 1932.

Notice how in each one of these examples you have different types of forensic scientists.

<https://www.pbs.org/wnet/nature/crime-scene-creatures-introduction/301/>

Self Assessment:

FORENSICS

© Can Stock Photo

Now is your chance to play the part of a forensics scientist and determine if the following items of evidence can be used to help solve crimes. Read the following cases, determine and defend your answer.

Case #1 -- In an assault case, pieces of a broken bottle were found at the scene of the crime. The bottom of the bottle was found in a suspect's car. What do you think, can the pieces of the bottle be associated with the suspect and used as possible evidence? _____ Defend your answer

Case #2 -- Can tire impressions found at the scene of a crime be used as possible evidence? _____
Defend your answer _____

Case #3 -- A cigarette butt was found at the scene of a crime, could it be used as evidence? _____
Defend your answer _____

Case #4 -- A suspect for a breaking and entering crime had a pair of boots that had mud on them. Could this mud be used as evidence? _____ Defend your answer _____

Extend Your Learning/Continued Practice:

Not only is forensics science about crimes dealing with humans but also about solving crimes against wildlife. Visit the U.S. Fish and Wildlife Service's Forensics Lab in Ashland, Oregon. This is the only lab in the world dedicated to solving crimes against wildlife. The lab uses forensic science and innovative techniques to bring wildlife traffickers to justice.

Check out the video below to learn more about this organization.

[Critter Crime Lab](#)



Answer Key:

1. Yes, if the pieces found will fit together and it can be proved to be the same type of class and/or same bottle.
2. Yes, it can be used if the tire shows wear or something unique about the tire tread. It can add to a case but not be the only evidence.
3. If it has DNA on it, then yes; but if there is no DNA it can't be used, it could have come from too many different sources.
4. Yes, different soils can be identified and be individualized to certain areas and locations. A shoe print would have been better though.

