CSI Experience: Rookie Training
Case 1 - ANSWERS

Directions:

In this activity you will learn about several techniques that are used to process physical evidence in a crime lab. In addition to firearms and tool marks you will review some other types of evidence previously covered in the course.

To get started go to: http://forensics.rice.edu/

You will visit 4 specialty areas. Pay attention to your instructor as each section requires you to answer a series of follow up questions to solve a case they are working on.

Answer the following questions as you proceed.

Forensic Biology:

Follow Greg and answer the following questions.

What is DNA? A “blueprint” for making an entire person. It contains all the information that makes us unique individuals.

After taking DNA from Suspects A & B - what 3 conclusions did you draw?
   1. It is found in many parts of the body
   2. Different parts of the body have the same DNA
   3. Different people have different DNA

Which suspect matched the crime scene DNA?  
Suspsect B

What is a DNA profile?
  A summary of one person’s DNA.

What is the name of the FBI’s DNA database?
CODIS (Combined DNA Index System)

In your own words, explain why forensic scientists use DNA markers.

How many markers are typically used by labs?
  There are 13 markers to make a DNA profile.

What are the four basic steps to process DNA?
  Extract, Amplify, Separate & Analyse

Why use buccal cells for DNA processing?
  It is fast, easy and painless.
What does “lyse” mean?
Burst

What is the name of the process used to amplify DNA?
PCR - Polymerase Chain Reaction

How is the amplified DNA sorted?
Genetic Analyzer, the computer separates the DNA sample by marker

What # did the DNA profile match?
Three

Why was Greg’s DNA profile in CODIS?
All CSI’s are required to have their DNA profiles on record.

Toxicology Lab:

Where is vitreous humor normally located?
Clear fluid inside the eye.

How is a maggot milkshake used?
It can determine what, when and sometimes where a person ate.

Why do toxicologists analyze so many different body fluids?
Looking at multiple fluids can confirm results.

Who invented Forensic Toxicology?
Mathieu Orfila

What is the name of the document you signed the evidence out on?
Chain of Custody Form

What is headspace?
A process that screens for alcohol.

What does the ELISA test for?
It tells us if certain drugs are in are present.

Define positive control.
A sample that purposely contains certain drugs.

Define negative control.
A sample that purposely does not contain certain drugs.

What is the name of the confirmatory test you conducted?
Gas Chromatograph/Mass Spectrometer (GC/MS)

What is the chemical formula of caffeine?
What other substance is found? (Name & Chemical formula)
Methcathinone C10H13NO

Firearms and Toolmarks:
Watch the training demos and then go to the firing range.
Record your score: _____________

Define class characteristics.
Class and Individual

Define individual characteristics.
Bullet Caliper - by knowing the caliper, you can rule out certain guns

What type of handgun had the correct class characteristics to match the bullet?
Taurus

What type of evidence is individual enough to match a bullet to a gun?
Striations

Medical Examiner:
You have 2 choices - Pick one and answer the appropriate questions:

Choice A: Conduct the autopsy -
What is the CAUSE of death? Ruptured Aneurysm
What is the MANNER of death? Undetermined

Choice B: Skip the autopsy -
Define algor mortis - Body Temperature, After death the body generally cools at a certain rate until it reaches the surrounding temperatures.

Define rigor mortis - Stiffening of the muscles. Over time the body can become so stiff it cannot be moved at all.

Define livor mortis - Discoloration of the body. Lower areas of the body, where the blood settles, turn dark, blue or purple.

Determine the manner of death for the following cases:
6877 - Accidental
11989 - Homicide
23380 - Suicide
4775 - Undetermined
94575 - Natural

CSI Ethics:
The Forensic Science Code of Ethics states that you must be:
- Impartial - Cannot be influenced by anyone or anything except the evidence
- Accurate - No room for Error
- Thorough - Sometimes a seemingly trivial piece of evidence can solve the case
- Truthful - Evidence never lies but people do. All our results must be reported accurately.