

<p><b>What is the definition of forensic science?</b></p> <p>The application of science and technology to those criminal and civil laws that are enforced by police agencies in a criminal justice system.</p>	<p><b>What is Locard’s Exchange Principle and how is this principle important to forensic science?</b></p> <p>Locard’s Exchange Principle states that wherever a person goes a contact will be made, leaving a transfer of materials between person and area. The principle is important because this is the way that evidence is left at a crime scene or taken from the scene on a criminal.</p>	<p><b>How does manner of death differ from the cause of death? What are the five categories of manners of death?</b></p> <p>Manner of death refers to the MOTIVE behind the death, such as natural, accidental, suicidal, homicidal, or undetermined. The cause of death refers to the SPECIFIC body injury, such as a heart attack, asphyxiation, or exsanguinations.</p>
<p><b>What are the major scientific disciplines involved in forensic science?</b></p> <p>Chemistry, biology, geology, and physics.</p>	<p><b>What are the four main reasons for the increase of crime labs in the United States?</b></p> <p>Increase in crime rates; increase in drug-related arrests; the advent of DNA testing; and emphasis on scientific evidence by Supreme Court rulings.</p>	<p><b>What are the three most basic types of crime scene recording methods? Name and describe them.</b></p> <p><u>Note taking</u>-writing down of events and evidence at a crime scene  <u>Photography</u>-recording evidence and condition of the scene in an unaltered condition  <u>Sketching</u>-a visual depiction, drawn to scale, of a crime scene and evidence.</p>
<p><b>What was Sir Arthur Conan Doyle famous for and how did he influence forensic science?</b></p> <p>Sir Arthur Conan Doyle created the fictional character Sherlock Holmes, which captivated readers with mystery/detective stories. Sherlock Holmes was the first forensic investigator.</p>	<p><b>What is an expert witness and how do they differ from a lay witness?</b></p> <p>An expert witness can give facts AND opinions based upon their training and knowledge in a field. A lay witness can only testify to those things known as facts—NO opinions can be given.</p>	<p><b>What are the parts that need to be included on all crime scene sketches?</b></p> <p>All evidence, legend or key, scale, and the NORTH direction.</p>
<p><b>What does the fourth amendment state and why are its contents important to police investigation?</b></p> <p>The fourth amendment states that no person can be searched without just cause and protects citizens from illegal search and seizure. Police must abide by the fourth amendment in investigations because evidence obtained illegally cannot be used in court.</p>	<p><b>What are the reasons that police officers can legally search property without a search warrant?</b></p> <p>A lawful arrest; an emergency situation; a search by consent; to prevent loss of property</p>	<p><b>What is a chain of custody document and why is it important in an investigation?</b></p> <p>A chain of custody document is a proof of the security of evidence. It is important that the chain of custody not be broken to prove the evidence has not been lost, destroyed or tampered with so that it may be used in court.</p>

<p><b>Why is recording a crime scene accurately important? Name two reasons in your answer.</b></p> <p>Recording a crime scene is important to reconstructing a crime scene for a jury in court, marking the exact location and condition of evidence and also can be helpful in later investigations.</p>	<p><b>What is the main prerequisite needed to properly photograph a crime scene?</b></p> <p>The evidence must be in an unaltered condition.</p>	<p><b>Describe the lead investigator's job in evaluating a crime scene.</b></p> <p>The lead investigator should:  Determine the boundaries of the scene;  Document and photograph obvious evidence;  Develop a strategy for a systematic examination and documentation of entire scene.</p>
<p><b>What is crime scene reconstruction?</b></p> <p>The method used to support a likely sequence of events by the observation and evaluation of physical evidence, as well as statements made by those involved with the incident, is referred to as reconstruction.</p>	<p><b>What types of evidence is needed to properly reconstruct a crime scene?</b></p> <p>Physical evidence, witness statements, police reports/911 calls, hospital accounts, etc.</p>	<p><b>Explain the difference between evidence that has class characteristics and evidence that has individual characteristics.</b></p> <p>Evidence with class characteristics connects an object to a GROUP and evidence with individual characteristics link an object to an INDIVIDUAL.</p>
<p><b>What are the basic metric units for mass, volume, and length?</b></p> <p>Mass is the gram; volume is the liter; and length is the meter</p>	<p><b>What happens in light dispersion?</b></p> <p>Light is separated into its' component colors of the visible spectrum.</p>	<p><b>What is the main chemical ingredient in ordinary glass evidence?</b></p> <p>Sand or soda lime</p>
<p><b>What are the differences between soda glass, pyrex glass, tempered glass, and laminated glass?</b></p> <p>Soda glass—ordinary glass  Pyrex glass—boron has been added; heat resistant  Tempered glass—side windows in cars; has been stressed so that it fractures without sharp edges  Laminated glass—front windows; plastic has been added over both sides of the glass</p>	<p><b>Explain how you can determine the difference between the entry and exit points of a piece of glass that has been hit by a projectile.</b></p> <p>The hole is wider on the exit side of the glass.</p>	<p><b>Explain how glass cracks. In your answer, include radial and concentric fractures.</b></p> <p>Glass cracks because its' elasticity is broken due to applied force. Radial cracks form first and are straight cracks from the center of the applied force. Concentric cracks then form circles around the center of the applied force.</p>

<p><b>Given two glass fractures located side-by-side, explain how you can determine which fracture occurred first.</b></p> <p>A fracture always ends at an existing line of fracture. The fracture that comes second will intersect, but not go past the first, existing fracture.</p>	<p><b>What is a physical property? Give three examples of these types of properties in your answer.</b></p> <p>A physical property describes a substance without reference to any other substance. Weight, color, volume, boiling points, and melting points are examples.</p>	<p><b>What is a chemical property? Give three examples of these types of properties in your answer.</b></p> <p>A chemical property describes the behavior of a substance when it reacts or combines with another substance. Wood burning, the creation of a gas during a chemical reaction, a color change during a chemical reaction are all chemical properties.</p>
<p><b>Explain how you can determine the direction of force impact on a piece of glass by looking at the stress marks.</b></p> <p>Three R Rule: Radial cracks form Right angles on the Reverse side of the force.</p>	<p><b>What are the three layers of the hair shaft? Which layer is most resistant to chemical decomposition?</b></p> <p>Cuticle, cortex, and medulla. The cuticle is the most resistant to chemical decomposition.</p>	<p><b>Why is the cortex important in the hair shaft?</b></p> <p>The cortex contains the pigment that gives hair its color.</p>
<p><b>What part of the hair shaft contains scales?</b></p> <p>The cuticle contains the scales.</p>	<p><b>What is the medulla? What are the three main classifications of medullae?</b></p> <p>The medulla is the central canal in the hair shaft. The three main types of medulla are continuous, discontinuous, and interrupted.</p>	<p><b>What is the difference between a natural and synthetic fiber? Which natural fiber is the most common?</b></p> <p>A natural fiber comes from either an animal or a plant source. A synthetic fiber is man made. The most common natural fiber is cotton.</p>
<p><b>What are the layers of automobile paint? Which layer gives the forensic scientist the most chemical information?</b></p> <p>Electrocoat primer; Primer Surfacer; Basecoat; Clearcoat. The basecoat gives forensic scientists the most information because of the chemical composition of the paint.</p>	<p><b>Who was Wayne Williams and why was his case important to Forensic Science?</b></p> <p>Wayne Williams was the Atlanta Child Murderer. The case was important to forensic science because it was the first case to be solved solely on fiber evidence.</p>	<p><b>Who was William West and why was his case important to Forensic Science?</b></p> <p>William West was arrested and disproved the theory that all people have different body measurements (anthropometry). It was important to forensic science because it started fingerprinting as a personal means of individual identification.</p>

<p><b>Have any two people been found to have the same identical fingerprints?</b></p> <p>No.</p>	<p><b>When are fingerprints formed?</b></p> <p>In the fetal stage of development</p>	<p><b>Besides identification, why are having fingerprints important?</b></p> <p>Fingerprints reduce slippage and increase grasp.</p>
<p><b>What are minutiae points and how are they important to the individuality of fingerprints?</b></p> <p>Minutiae points are microscopic characteristics of ridges in fingerprints. Even though people can have the same category of prints, the minutiae points make each individual print unique.</p>	<p><b>What is the difference between a visible, latent, and plastic fingerprint?</b></p> <p>Visible prints—can be seen with the naked eye  Latent prints—cannot be seen with the naked eye  Plastic prints—fingerprints left in a waxy surface</p>	<p><b>What is the most common type of fingerprint pattern? The rarest type of pattern?</b></p> <p>Most common—loops  Most rare--arches</p>
<p><b>What is AFIS? How is using this tool important to forensic scientists?</b></p> <p>Automated Fingerprint Identification System. It is a computerized system that stores fingerprints of known offenders and can be searched to find new suspects.</p>	<p><b>What substance, used to recover latent fingerprints gives a white print after processing?</b></p> <p>Superglue fuming</p>	<p><b>What substance, used to recover latent fingerprints, gives a purple print after processing?</b></p> <p>Ninhydrin</p>
<p><b>Who was the scientist that won a Nobel Prize for his work with blood typing?</b></p> <p>Karl Landsteiner</p>	<p><b>What two parts of the blood have the most forensic information?</b></p> <p>The red blood cells (erythrocytes)—contain antigens and the serum—contains antibodies.</p>	<p><b>What are antibodies and where are they found?</b></p> <p>Antibodies are cells that fight off infection. They are found in the serum.</p>

<p><b>What is a luminol test? What would a positive reaction look like?</b></p> <p>The luminol test detects whether or not blood is present. A positive reaction would be glowing or illumination of the stain.</p>	<p><b>What is the Kastle-Meyer Color Test? What would a positive reaction look like?</b></p> <p>The Kastle-Meyer color test detects whether or not blood is present. A positive reaction would be a pink color after adding phenolphthalein.</p>	<p><b>What is a Hemastix test? What would a positive reaction look like?</b></p> <p>The Hemastix test detects whether or not blood is present. A positive reaction would be green color on the test.</p>
<p><b>What is the precipitin test? What does it test for?</b></p> <p>The precipitin test is a test in which a precipitate (clot) forms when human blood comes into contact with human antiserum. It is a test for human blood.</p>	<p><b>What material does the acid phosphatase test look for?</b></p> <p>Semen</p>	<p><b>What does a blood stain that has impacted a site at LESS than 90 degrees look like?</b></p> <p>It is an elongated stain.</p>
<p><b>What shape does a blood stain that has impacted a site at a 90 angle have?</b></p> <p>Circular</p>	<p><b>Which end of a bloodstain always point in the direction of travel?</b></p> <p>The pointed end</p>	<p><b>What is agglutination? When does it happen?</b></p> <p>Agglutination is the clumping of blood cells due to an antibody-antigen reaction. It happens when people get the wrong blood type.</p>
<p><b>What is serology?</b></p> <p>Serology is the study of antigen-antibody reactions.</p>	<p><b>What is hemoglobin and why is it important?</b></p> <p>Hemoglobin is a protein that carries oxygen through the blood to the body.</p>	<p><b>What is exsanguination?</b></p> <p>Exsanguination is bleeding out due to the breach of an artery or injury.</p>

<p><b>What is asphyxiation?</b></p> <p>Asphyxiation is the lack of oxygen to the brain.</p>	<p><b>What is the name of the person who performs autopsies in cases where the cause of death is questionable?</b></p> <p>Medical examiner or coroner</p>	<p><b>What do forensic anthropologists usually study?</b></p> <p>Forensic anthropology is the study of bones and skeletal remains, usually to make identification of a victim of a crime.</p>
<p><b>What is the difference between algor mortis, rigor mortis, and livor mortis?</b></p> <p>Algor mortis is the cooling of the body after death; Rigor mortis is the stiffening of the muscles; Livor mortis is the pooling of blood due to gravity</p>	<p><b>What is the difference between a central nervous system stimulant and a central nervous system depressant? Include in your answer one example of each.</b></p> <p>Stimulant speeds the CNS up and a depressant slows the CNS down. Alcohol is a depressant and cocaine is a stimulant.</p>	<p><b>What part of the body would a forensic anthropologist most likely use to determine height?</b></p> <p>A long bone such as the femur or the humerus</p>
<p><b>What part of the body would a forensic anthropologist most likely use to determine sex?</b></p> <p>The pelvic bone or the skull</p>	<p><b>What part of the body would a forensic anthropologist most likely use to determine race?</b></p> <p>The skull</p>	<p><b>What is facial reconstruction and how could it be useful to a forensic scientist?</b></p> <p>Facial reconstruction is the building of clay as tissue around a skull. It aides investigators in finding victims of crimes.</p>
<p><b>What are defensive wounds and where would they be likely found?</b></p> <p>The little finger side of the arm</p>	<p><b>What is the difference between low velocity, medium velocity, and high velocity blood spatter? Include one cause of each in your answer.</b></p> <p>Low velocity—dripping—simple cut  Medium velocity—medium size drops—beating  High velocity—small droplets--gunshot</p>	<p><b>What would the correct packaging be for charred material found at a crime scene? Why would you use this type of packaging?</b></p> <p>Closed container because it prevents evaporation of an accelerant</p>

<p><b>What would the correct packaging be for bloodstained material found at a crime scene? Why would you use this type of packaging?</b></p> <p>A container that is not air-tight. It prevents evidence being contaminated by mold or mildew.</p>	<p><b>Name the purines and describe their structure.</b></p> <p>Purines are adenine and guanine. Purines are larger in structure than pyrimidines.</p>	<p><b>Name the pyrimidines and describe their structure.</b></p> <p>Pyrimidines are cytosine and thymine. Pyrimidines are smaller in structure than purines.</p>
<p><b>What is the process called in which DNA makes a copy of itself?</b></p> <p>Replication</p>	<p><b>What is a nitrogenous base? Where are they found in DNA?</b></p> <p>A base that contains nitrogen. They are adenine, thymine, cytosine, and guanine. They are found on the nucleotide between the backbone of the DNA.</p>	<p><b>What does "DNA" stand for?</b></p> <p>Deoxyribonucleic acid</p>
<p><b>Explain the contributions of Rosalind Franklin, William Chargaff, and Watson and Crick to the discovery of the structure of the DNA molecule.</b></p> <p>Rosalind Franklin found the physical structure through Xrays, William Chargaff discovered the chemical structure, and Watson and Crick put all of the pieces together.</p>	<p><b>What is the difference between mtDNA and nDNA analysis?</b></p> <p>mtDNA is mitochondrial analysis and nDNA is nuclear DNA analysis.</p>	<p><b>What are the base pairing rules in DNA?</b></p> <p>Cytosine bonds with Guanine Adenine bonds with Thymine</p>
<p><b>What is CODIS and how does it help forensic scientists?</b></p> <p>CODIS is a national database for offenders of violent crime. It helps forensic scientists by having a way to search for a DNA profile.</p>	<p><b>Describe what makes a DNA molecule stable.</b></p> <p>The amounts of Cytosine and Guanine molecules because of the amount of hydrogen bonds between them (three).</p>	<p><b>Describe the process of PCR and explain why it is important to Forensic Science.</b></p> <p>PCR allows forensic scientists to copy small amounts of DNA that may be left at a crime scene.</p>