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FORENSICS

Explore a fascinating world where microscopes, fingerprints, and DNA help uncover the truth, and where faith and science work together.

Dr. Jennifer Rivera



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1 WHAT IS FORENSIC SCIENCE?



Each field of forensic science points toward the Creator God as the Author and Designer of science. That's amazing!

Great are the works of the LORD, *studied by all who delight in them.*
—Psalm 111:2

Forensic mineralogy	The study of minerals
Forensic anthropology	The study of bones
Forensic dactyloscopy [dak-tuh-LAH-skuh-pee]	The study of fingerprints
Wildlife forensics	The study of animals involved in crime
Digital forensics	The study of technology used in crime

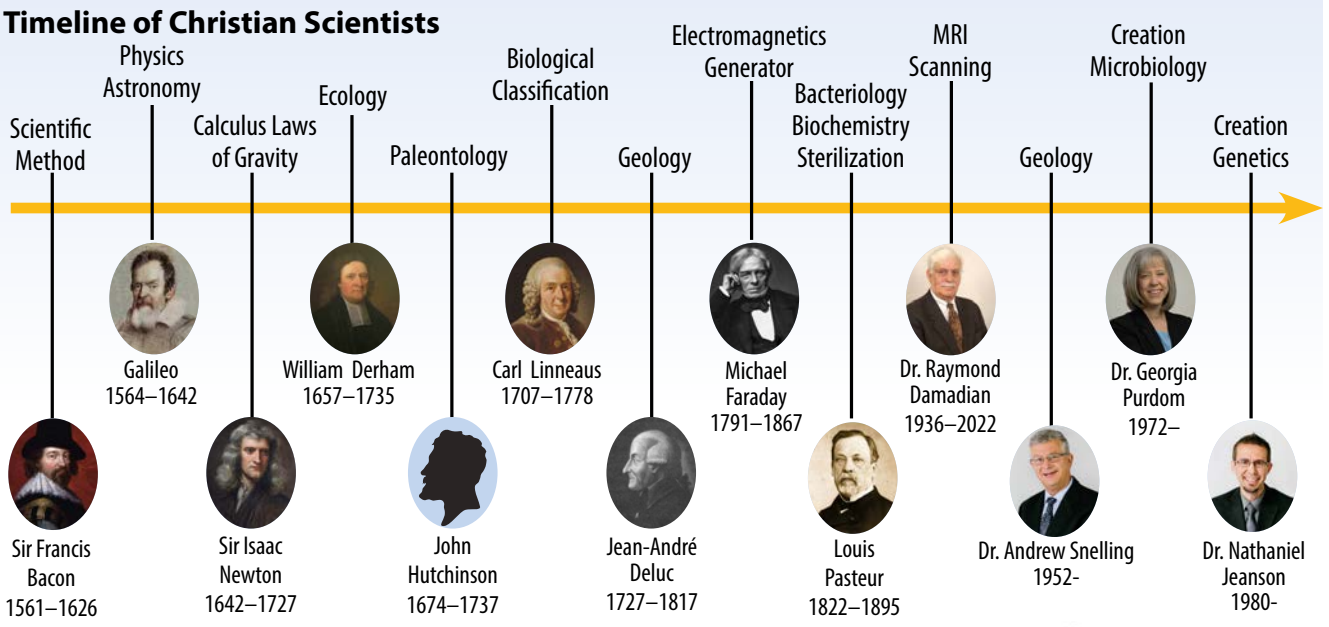
What Is Science?

The Latin root for the word science is *scientia,* which means "knowledge." Where did knowledge come from? There is only one source that provides an accurate answer: the Bible. It is a history book that is the perfect Word of God from the very first verse. It tells us that science (knowledge) cannot exist apart from God.

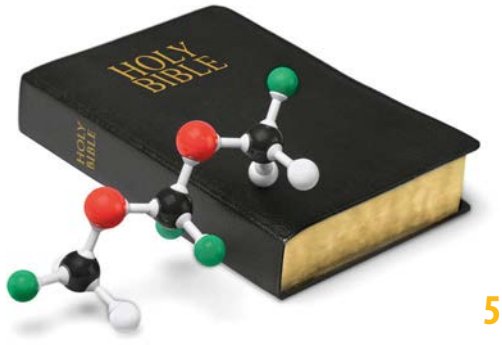
The Beginning of Knowledge	Reference
In the beginning, God created everything from nothing.	Genesis 1
God created man in His image with an inborn knowledge of Him.	Genesis 1:26–27 Romans 1:21 Romans 2:15
At the end of the creation week, knowledge was perfect and "very good."	Genesis 1:31
Man's sin against God corrupted knowledge.	Genesis 3:6
Humans sinfully desire knowledge for self-glorification.	Genesis 11:4
Jesus Christ is the only source of knowledge.	Colossians 2:2–3 Luke 24:25–27
Salvation through the Cross is the only path to true knowledge.	1 Corinthians 1:18
One day, God will restore the perfect knowledge of Him.	1 John 3:2

The Knowledge of God	Reference
He is the God of knowledge.	Psalm 139:1–6
He has infinite knowledge.	Psalm 147:5
His knowledge is separate from human knowledge.	Isaiah 55:8
His knowledge is perfect.	Job 37:16
His knowledge is denied by the wicked.	Psalm 73:11–12
The believer is secure in this knowledge.	1 John 3:20

Timeline of Christian Scientists



Science cannot exist without God. Many important scientists throughout history believed in our Creator God!





Forensic science exists because Adam and Eve sinned against God. With sin came crime. The first crime in history is recorded in Genesis 4:1-17 when Cain murdered his brother Abel. Cain was jealous that God accepted Abel's sacrifice but not his own. As a result, Cain took Abel's life. Our all-knowing God knew exactly what Cain had done, and we see the first questioning of a suspect when the Lord asked Cain, "Where is your brother Abel?" (Gen. 4:9). Cain responded to the Lord with a lie: "I don't know," he replied. "Am I my brother's keeper?"

The only perfect, righteous Judge confronted Cain about his crime: The Lord said, "What have you done? Listen! Your brother's blood cries out to me from the ground." God then passed the first judgment for a crime when He told Cain, "Now you are under a curse and driven from the ground, which opened its mouth to receive your brother's blood from your hand. When you work the ground, it will no longer yield its crops for you. You will be a restless wanderer on the earth" (Gen. 4:11–12).



Cain pleaded to the Lord, "My punishment is more than I can bear" (Gen. 4:13). Cain recognized that he would be a wanderer, separated from his parents and his family. God, in His great mercy, protected Cain so that no one who found him would kill him (Gen. 4:15). Cain then fled to the land of Nod.

God knew that humans would sin against Him. Our amazing God created scientific methods and processes, along with the human ability to analyze and think critically, to solve crimes and bring about justice.

PROTECT YOURSELF



NEVER GIVE OUT PERSONAL INFORMATION — such as phone number, address, birthdate, Social Security number, school, or church — to a stranger or someone you do not know on social media. People who aren't safe try to steal this information. They may even want to harm you.



Forensic Science: A Toolkit for Solving Crime

The word forensic is derived from the Latin word *forensis* which means "of or before the forum," which referred to the place where many trials and hearings happened. Forensic science uses investigation, evidence, and the court system to bring justice into God's sinful, broken world.

What is forensic investigation? It is the examination of evidence.



Forensic investigation includes:

- Protecting the crime scene from contamination
- Collecting and examining evidence
- Processing and testing of evidence
- Analyzing results
- Reaching a conclusion
- Reporting the information
- Cooperating with other law enforcement agencies
- Delivering the facts clearly and professionally in court



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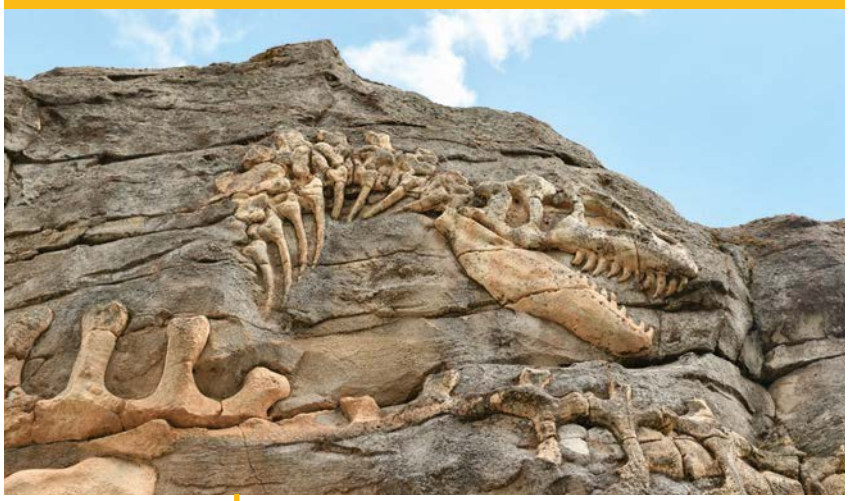
The fictional character Sherlock Holmes, created by Sir Arthur Conan Doyle, relied on forensic science in his investigations long before police departments did. In one of his books, Holmes used blood testing, footprint analysis, tobacco ash examination, and handwriting analysis to solve a crime.

2 TWO TYPES OF SCIENCE

There are two types of science: historical science and observational science. It is important to understand the difference between them.

HISTORICAL Science

Historical science is the study of items or evidence from the past that we cannot observe (see) in their original form. This kind of science is also called *origins science*. A good example of historical science is fossils. When we find fossils, they do not have a tag hanging on them with the name of the specimen or its age. We must interpret the evidence to figure it out, because we cannot observe what happened in the past.



Forensic science is another example of historical science. When crime scene investigators go to a location, the crime has already taken place. They must gather and interpret the evidence and eyewitness testimony to piece together what may have happened.





This is why a jury deciding the guilt of a suspect does not always agree. No jury member saw the crime take place. Their bias, interpretation, understanding, and assumptions about the evidence affect their decision about guilt or innocence.

Our Creator gave us the ability and desire to explore the universe.

OBSERVATIONAL Science

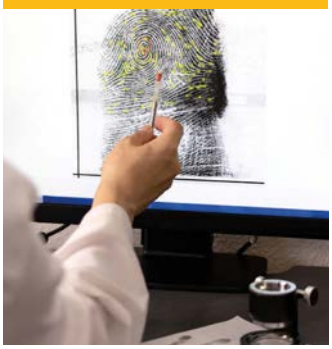
This science uses direct observation (what you can see), the five senses, and the scientific method to study the evidence. Another name for observational science is *operational science*.



Do we use observational science to solve crimes? Yes. We can see, hear, smell, and touch items at a scene, but the information gathered from collecting and processing evidence is connected to an event that happened in the past, which is unobservable in its original form (historical science). Because forensics deals with a crime that has already occurred, investigators use a hypothesis (an educated guess based on facts) about what happened at the crime scene.

Investigators and scientists have their own viewpoint or worldview. It is the lens through which they interpret evidence. This is why it is important to use God's Word as our lens when we study science. God's Word is the only source of truth, and science confirms the Bible.

For by him all things were created, in heaven and on earth, visible and invisible, whether thrones or dominions rulers or authorities — all things were created through him and for him. —Colossians 1:16.



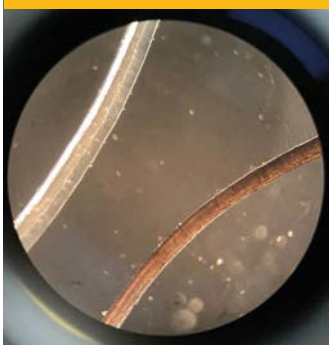
Fingerprint Analysis



DNA Profiling



Impressions



Hair Analysis

What Is the Scientific Method?

God created an orderly universe. Because of this order, we can formulate an idea about what may happen when we conduct an experiment. If our world was the result of random chance, we would not be able to test ideas. The step-by-step process we use to test our ideas about how something works (or happened) is called the *scientific method*. Let's use this method to walk through a forensic case study.

Imagine you are called to a crime scene.
You are told that a wallet has been stolen from a customer at a local coffee shop.

Ask a Question		☐ **Step 1:** You must first ask a question: Is there an eyewitness to the theft of the wallet?
Research		☐ **Step 2:** Often, research is required. You may need to ask the coffee shop manager if they have security cameras or if any employees witnessed the theft.
Form a Hypothesis		☐ **Step 3:** You will then formulate a hypothesis. A good format for a hypothesis is an "if/then" statement. For example, "if" I review the security footage at the coffee shop, "then" I may find clues to identify the thief.
Experiment		☐ **Step 4:** This step involves the actual experimentation. In this case, it could include retrieving the security footage and experimenting with different types of digital technology to clean up the footage, amplify the sound quality in the video, and identify possible suspects.
Analyze the Results		☐ **Step 5:** In this stage, you will analyze the results and determine if more experimentation is necessary or additional steps are needed before drawing conclusions. For our case study, we assume the viewing of the security footage identified a possible suspect you can question about the theft.
Conclusion		☐ **Step 6:** It is time to develop your conclusion. Were you correct in your hypothesis? Were you able to solve the crime? The conclusion involves sharing results with colleagues in the field, in addition to verifying your results by having another scientist verify that your conclusion is accurate.

Crime scene work involves both historical and observational science — observational science to process evidence, and historical science to apply those results to a crime in the past.



Is forensic science about "good" people putting "bad" people in prison? No. Investigators with a biblical worldview recognize that all of us live in an imperfect, sinful world.

At the end of creation week, God said everything He had made was "very good" (Genesis 1:31). The universe — including the land, weather, plants, animals, and humans — was perfect. There was no suffering, disease, death, or crime. When Adam and Eve sinned against God, everything changed. Their sin corrupted God's perfect world, and since then, every person enters this world with a sinful nature (Romans 5:12). Everyone needs redemption through Jesus Christ.

Yet, being sinful does not mean we should ignore crime. Society has a responsibility to protect people and uphold justice. The Bible teaches that wrongdoing can have different earthly consequences, even though all sin separates us from God. Forensic science helps investigators discover the truth, identify those responsible, protect the innocent, and help bring justice. Forensic investigators help uphold justice in a sinful world.



PROTECT YOURSELF



NEVER APPROACH A VEHICLE driven by a person you do not know and trust. Criminals use items like candy, kittens, puppies, and toys to lure children to their cars with the intention of doing them harm.



FACT FILES

Can you think of historical sciences besides forensic science? Historical sciences investigate clues from the past. Paleontology is the study of fossils. Geology is the study of rock layers and the history of the earth. Archaeology studies objects and ruins left behind by people long ago. All of these sciences use evidence from the past to learn what happened. Though each deals with evidence that is unobservable in its original form, they all confirm what we read in the Bible. We can trust God's Word from the very first verse.

3 THE CRIME SCENE

What Exactly Is a Crime Scene?

It is the physical place where a crime took place. Crime scene investigators must connect three things to the physical location: a victim, a crime, and a suspect. They link these together with evidence and eyewitness testimony.

One of the biggest challenges investigators face at every crime scene is that they did not see the crime occur. They arrive at a place where a crime occurred in the past (remember, this is *historical science*). investigators must find and collect evidence that will help identify and convict criminals and bring about justice. Because work at a crime scene may be used in court, exact procedures and processes must be followed to make sure that the results are reliable and accurate.





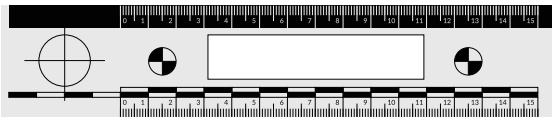
Investigative Procedures for a Crime Scene

- ☐ Ensure personal safety and secure the area.
- ☐ Provide medical aid if needed.
- ☐ Establish a perimeter and restrict access to the scene.
- ☐ Document (write down) initial observations.
- ☐ Identify, document, and preserve evidence.
- ☐ Photograph and record the scene.
- ☐ Collect and package evidence properly.
- ☐ Maintain chain of custody.
- ☐ Submit evidence for analysis.
- ☐ Prepare reports and follow up with additional evidence.

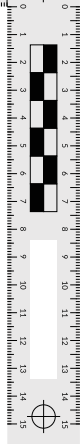


The specific processes used in crime scene investigation are possible because God created a world with order. Without order, the universe and everything in it would be chaos. However, God holds the world together in His hands and brings organization, complexity, and design to the world. Because of this, investigators can make predictions and test them. They can hypothesize, develop an experiment, complete that experiment, and verify the results. Aren't you thankful that you are not the result of chance or random processes? You (and all of creation) are a complex creation, designed in the image of our Creator God.

Imagine you are the first person to arrive at a crime scene. What should you do?

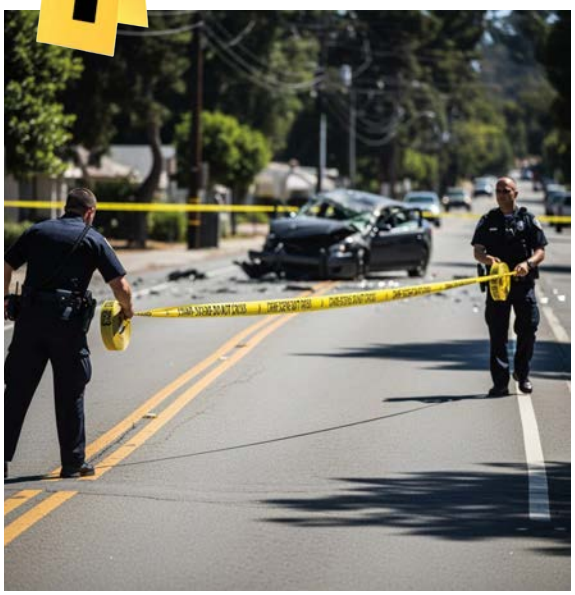






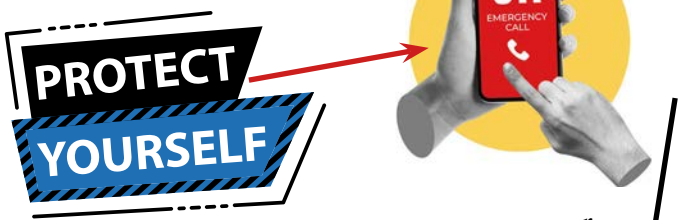


1 Secure the Crime Scene



The first step at a crime scene is making sure the area is safe and providing medical care for victims. Then an officer must protect the scene from contamination by other officials, bystanders, victim's family or friends, and the media. Contamination happens when items unrelated to the crime are added (such as someone touching an object and leaving fingerprints), or when evidence connected to the crime is destroyed (like rain washing away footprints or blood trails). Yellow crime scene tape is used to keep unauthorized people out. An officer will also ask for a crime scene unit to search for and collect the evidence properly. Once that team arrives, it will work quickly to record the crime scene by using photography, videography, sketches, and notes. This is called *recording the crime scene.*





If you ever come upon a crime in progress or think you have entered the scene of a crime, do not touch anything! Leave the area and CALL 911 IMMEDIATELY.

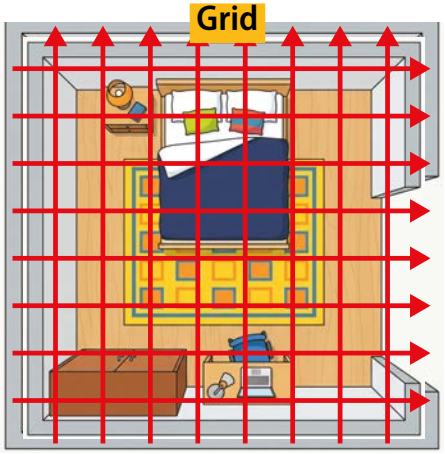


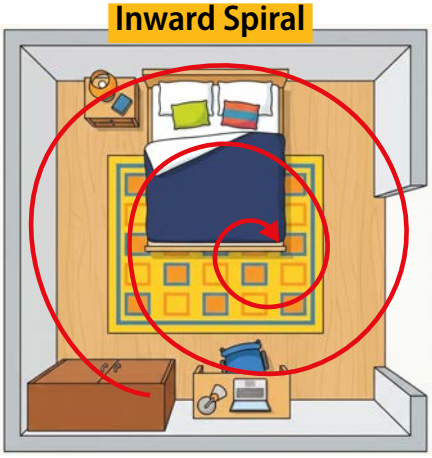
Record the Crime Scene

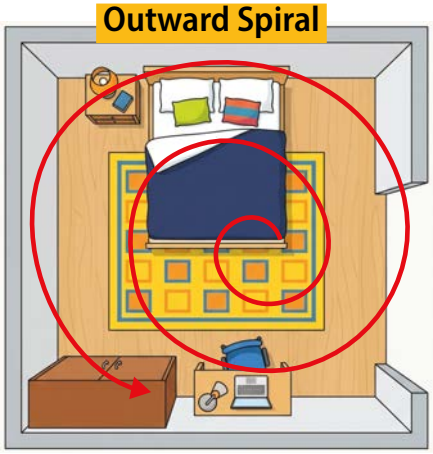
Preserving the crime scene with photography and video footage is one of the most important steps in discovering and gathering evidence. Investigators will begin by observing the scene and assigning each piece of potential evidence a number.

2

All pieces of evidence are photographed with and without measurements. Once investigators finish their work at the crime scene and all the evidence is collected, they will leave the scene. Rarely will they be able go back and see the scene in its initial form. Photographs and videos allow investigators to study the scene in its original condition and see evidence in its original location.



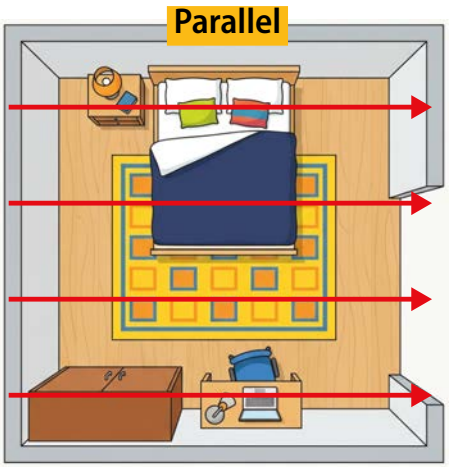


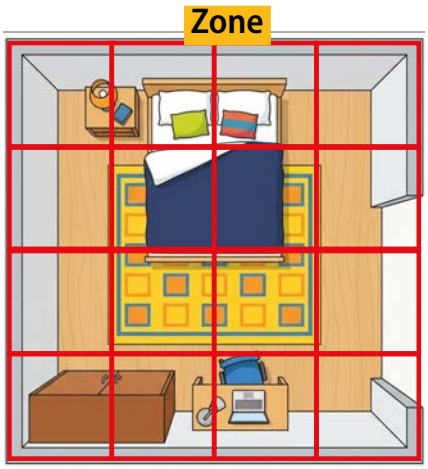


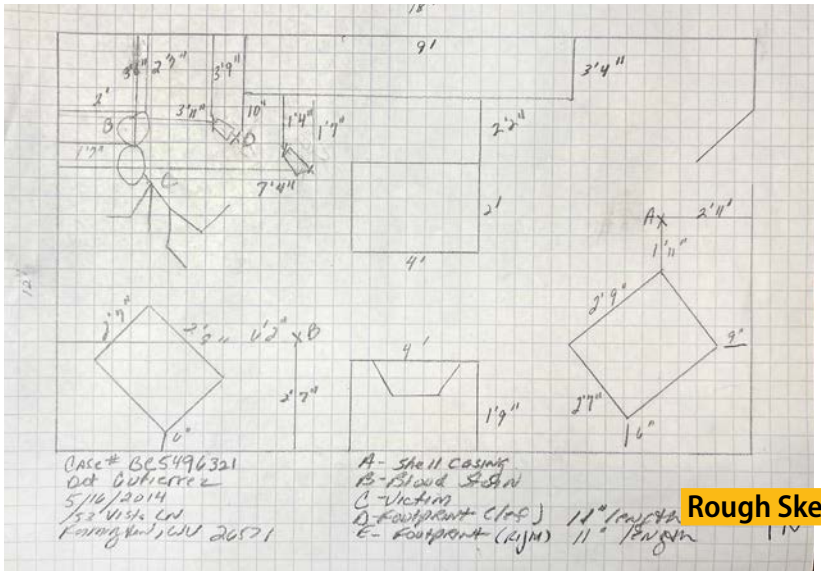
3

Search Patterns

Because every crime scene is unique, different search patterns can be used in the search for evidence. The most common types include grid, spiral-inward, spiral-outward, parallel, and zone. Each search pattern requires the investigator to pay attention to all types of potential evidence.







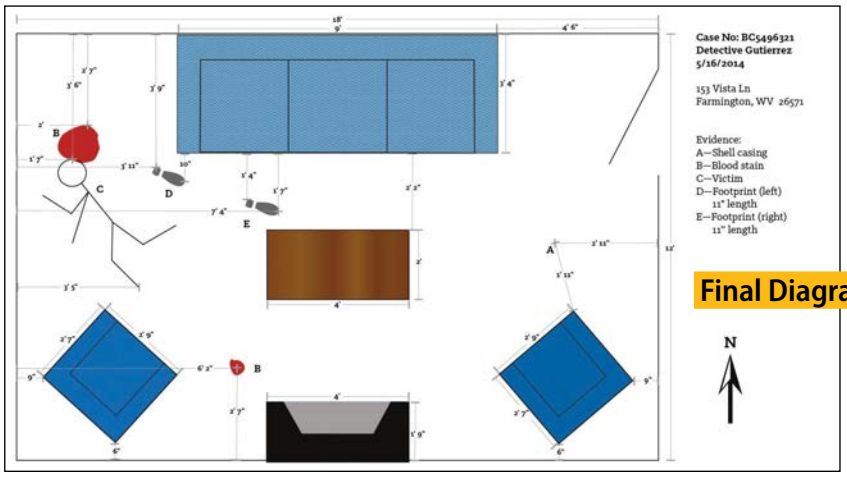
Rough Sketch

Sketch

All crime scenes investigations must include two sketches: a rough sketch and a finished sketch (or diagram). Rough sketches are completed at the crime scene but are not drawn to scale. A finished sketch is created to scale, which means the sizes in the diagram match real-life proportions. Only the final sketch is used in court.

Rough Sketch Checklist

- ☐ Measurements of items at the scene
- ☐ Location and size of all doors, windows, and large furniture
- ☐ Accurate measurements of all evidence to fixed locations (furniture, doors, etc.)
- ☐ Marked point of entry and point of exit by the culprit (if possible to determine)
- ☐ A detailed legend of the evidence coordinating to the sketch
- ☐ A compass showing which direction is north
- ☐ Case information (officers at the scene, address of crime, case number, date, etc.)



Final Diagram

A finished diagram is created to scale for official use in court. It can be designed using **CAD** (computer-aided design) software. This sketch is often three-dimensional, created in color, and drawn to scale. The finished diagram will include all the information provided in the rough sketch.

Make Notes

The third part of recording the crime scene is taking detailed notes. These are descriptions of what you observe at the scene. Notes should include details you want to remember about the location of the evidence, items lying close to the scene, weather conditions, and other information that may not be in the photographs or a sketch.



FACT FILES

Did you know investigators can now use drones to map a crime scene? Drones can be equipped with mapping software that captures a 3D model of the crime scene. This is a safer method for police officers, and the maps can be used for courtroom presentations.