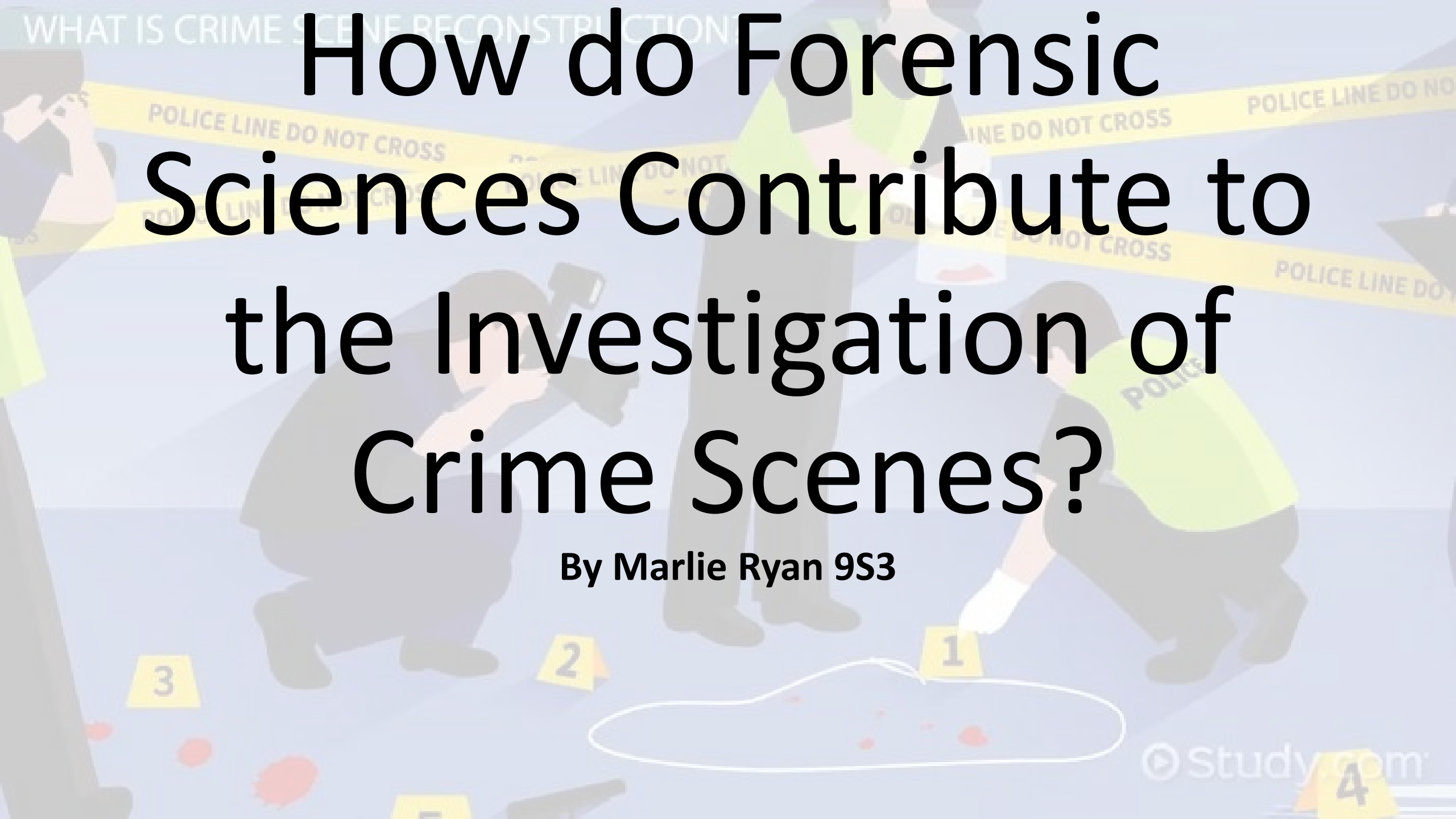


# How do Forensic Sciences Contribute to the Investigation of Crime Scenes?

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# Who does the work in a crime scene investigation?

Unlike what we see in movies and TV shows, there is not just one detective that carries out the whole investigation, trained in all fields. In reality there are many different roles and jobs that are involved in collecting important information and evidence to then eventually piece together the crime committed.

# Who does the work? – Crime Scene

## Supervisor

Depending on the type of crime committed and the law enforcement agency in charge, those who conduct the investigation at the crime scene vary. This is due the wide range of more specific careers people have. Unlike on TV one person is not trained in all areas of forensic sciences, therefore either the person with the training most appropriate to the crime or a group of people with all contribute.

| Job name:                          | Job description:  |
|------------------------------------|---|
| Crime scene supervisor/team leader | <p>Although this job has a varied number of names, they all usually obtain the same role. The leader of a crime scene investigation is in charge of:</p> <ul style="list-style-type: none"><li>• Ensuring the <b>safety of all workers</b>, this includes making sure everyone is wearing the correct protective clothing and equipment, to protect them from any evidence that may cause a risk hazard.</li><li>• Conduct the initial walk-through also know as the preliminary survey, in which crime scene supervisors <b>insure the perimeter is secured, highlight any key evidence</b> visible at first glance and <b>begin to put together a narrative</b> of what occurred at the crime scene.</li><li>• Determine search patterns and assign roles for team members</li><li>• Allow for needed equipment and supplies to be accessible for those working</li><li>• Control traffic in and through the crime scene by logging all workers</li><li>• All material and evidence that is collected from the crime scene is thoroughly collected and logged, assuring for no mistakes or mishaps.</li></ul> |

# Who does the work? – Photographer

| <b>Job name:</b>                              | <b>Job description:</b>  |
|---|--|
| Photographer and<br>Photographic Log Recorder | <ul style="list-style-type: none"><li>• Photograph the entire crime scene before anyone else has entered or touch anything/tampered with evidence. This done at overall, medium and close-up coverage, using measurement scale when appropriate.</li><li>• Photograph surrounding victims, crowds and vehicles (depending on the form of crime committed) – any important evidence or information that is not considered to be in the crime scene.</li><li>• Major evidence is photographed at close proximity before any movement or human contact (this step coordinated with the Sketch Preparer, Evidence Recorder, and Evidence Recovery Personnel.</li><li>• Photograph all concealed fingerprints and other impression evidence before lifting/casting are done (more information on this – slide _).</li><li>• Finally these prepare a photographic log for later uses in the investigation.</li></ul> |

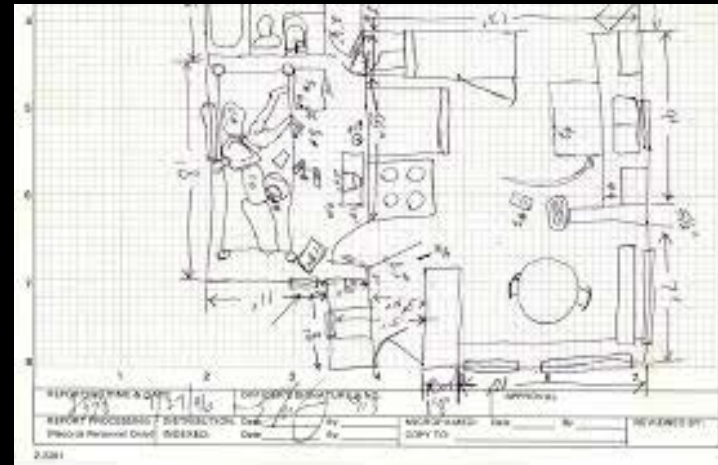
# Who does the work? – Forensic

## Artist

| Job name:                       | Job description:  |
|---------------------------------|---|
| Sketch preparer/forensic artist | <ul style="list-style-type: none"><li>• Immediately sketch a diagram of the crime scene with proper orientation (by hand or digitally)</li><li>• Highlight major items of evidence in the sketch</li><li>• Appoint and label areas to be searched, advise team leader and other team members of nomenclature for designated areas.</li><li>• Assist with needed tasks including the taking of measurements</li><li>• Ensure all key information and notes are included in sketch (e.g. keys, scale, orientation, labelling)</li></ul> |



Digitally drawn sketch of a crime scene.



Hand drawn sketch of a crime scene.

# Who does the work? – Evidence Recorder

| Job name:                   | Job description:  |
|-----------------------------|---|
| Evidence Recorder/Custodian | <ul style="list-style-type: none"><li>• Make sure all evidence is photographed prior to its collection and logging</li><li>• Describe evidence and its location on appropriate bag or envelope.</li><li>• Thoroughly sign and date evidence containers and maintain chain of custody.</li><li>• Appropriately collect and package evidence to maximize evidence integrity.</li><li>• Maintain evidence log.</li><li>• Use appropriate protective equipment (gloves) and methods when dealing with potentially infective evidence (blood).</li></ul> |



An example of collection of evidence – ballistics/guns

A blank form titled "CRIME SCENE EVIDENCE LOG". At the top, there are two fields: "LAB NUMBER" and "AGENCY CASE NUMBER". Below these are several rows of a table with columns for "LAB NUMBER", "ITEM #", "MARKER #", "Description or Location of Item", "DATE", "TIME", and "Collected BY". The table is currently empty, ready for data entry.

Crime scene evidence log

# Who does the work? – Specialists

As mentioned earlier, due to the varied jobs within forensic science not one person can conduct investigation on a crime (scene). Specialists come into the picture when there is a need to bring in expertise from outside of the agency.

| Job name:   | Job description:  |
|-------------|---|
| Specialists | <p>Types of specialists and their duties:</p> <ul style="list-style-type: none"><li data-bbox="486 634 2448 905">• <b>Blood Spatter Analyst:</b><br/>A blood spatter analysis investigate blood or blood patterns in usually violent crimes such as murders to help find the killer and determined what happened. The type of weapon, number of blows, placement of both victims and suspects during and after an attack, and the window of time in which the crime probably took place can all me determined by this specialist.</li><li data-bbox="486 919 2448 1190">• <b>Toxicologist:</b><br/>Forensic Toxicologists conduct testing on a victims bodily fluids and tissue samples to see if any drugs or chemicals are present in the body that may have contributed to the crime. These substances include: Alcohol, illegal or prescription drugs, other chemicals, poisons, metals, gases, such as carbon monoxide</li></ul> |

# Who does the work? – Specialists

| Job name:   | Job description:  |
|-------------|---|
| Specialists | <ul style="list-style-type: none"><li data-bbox="563 396 1207 439">• <b>Computer or Cyber Forensics:</b><br/>The goal of computer forensics is to perform a structured investigation while maintaining a documented chain of evidence to find out exactly what happened on a computing device and who was responsible for it.</li><li data-bbox="563 625 2448 896">• <b>Forensic Phycologists:</b><br/>They apply psychological knowledge, theory and skills to the understanding and functioning of legal and criminal justice systems. They often work in criminal, civil and family legal contexts and provide services for litigants, perpetrators, victims, and personnel of government and community organisations.</li><li data-bbox="563 911 2448 1125">• <b>Forensic Pathologist:</b><br/>Ultimately, it is the forensic pathologist's job to find out cause-of-death, especially when it is suspected that the death was not due to natural causes. They perform an autopsy, which involves observing both the outside and inside of the victim.</li><li data-bbox="563 1139 2448 1353">• <b>Forensic Phycologists:</b><br/>Forensic psychology studies the thoughts behind an attacker's actions. Before thinking about how to catch a suspect, forensic psychologists consider why the act was committed. They look at sources of extreme stress in the perpetrator's life that might push them to act violently.</li></ul> |



# What is the process of investigation at a crime scene?

It is extremely important for those working at crime scenes to have a strict set of rules and regulations in place to lessen the risk of evidence contamination, loss of key information or even missing a piece of information all together. This then leads to the order of tasks that must be performed at a crime scene in order to correctly gather evidence and information.

# Step 1: before beginning investigation

Upon arrival at the crime scene, the crime scene investigator will discuss key information with detectives/police who requested the crime scene processing services, or with the detective/officer assigned to oversee or manage the crime scene.

## 1) Information exchange

**By talking to those first called to the crime scene the crime scene supervisor will obtain the following information:**

- Agency case number assigned to the investigation.
- Type of agency investigation.
- Exact location of the scene.
- Detective and reporting officer's names and identification numbers.
- Names of victim(s) and personal information, if needed.

**Additional information may be required due to the type of crime scene investigation including the following:**

- Suspect information.
- Vehicle(s) information.
- Witness names.
- Additional crime scene locations.

# Step 1: before beginning investigation

## 2) Establishing crime scene dimensions by locating the “focal point”

The first thing that investigators and crime scene supervisors will do when arriving at the crime scene is **identifying/establishing scene dimensions**. This involves **locating the “focal point”**, or the main area of disturbance within the crime scene. Usually this is one of the following:

- Ransacked (bed)room
- The location of where an attack occurred
- A room where a victim/body was found

The purpose of locating the “focal point” is so then investigators can then establish **the crime scene dimensions** and mark out an area around the scene that is large enough to include any evidence from the crime scene. Investigators often set the crime scene dimensions much larger than needed at first and then go onto condense the perimeter to a more specific area. This is due to the risk of missing key information. Setting larger dimensions to begin with also allows for onlookers not to contaminate evidence that may be outside the “focal point”.

## 3) Identifying potential health and safety hazards

As in most industries it is of high importance for those in charge to keep all though working at the crime scene safe, therefore one of the initial procedure that takes place is the identification of any safety or health hazards. These often include:

- Weapons
- Biohazards
- Chemical hazards
- Even intentional traps



# Step 1: before beginning investigation

## 4) Establishing security

Locard's Exchange principle states that perpetrator of a crime will always either bring something into the crime scene or leave with something from it. This also relates to those who enter and exit the crime scene during the investigation process, even if they don't always mean to. This highlights the importance of establishing security around the premises of a crime scene.

- As seen often on TV or in the movies a **yellow crime scene tape** will be used to mark out the perimeter of a crime scene.
- A single entry and exit way will be identify, so that everyone who enters and exits the crime scene can be documented.
- Sometimes there will be a specific area for the storage of evidence so it is not to be contaminated or misplaced
- Depending on the number of people/investigators present, sometimes security guards will be placed around the perimeter of the crime scene.



# Step 1: before beginning investigation

## 5) Communication and creating a plan

Due to the wide variety of different crimes and crime scenes that forensics are used to investigate, it is important for crime scene investigators to make a thorough plan with their team to make sure everyone is on the same page about the process of investigation.

These are some important steps used to create a plan of investigation:

- Create theories of what type of crime may of occurred at the crime scene (this allows investigators to make links between any evidence that is found)
- Gather information from witnesses or suspect that have a connection to the crime (scene).
- Create an evidence collection strategy – this often involves taking weather (especially if the crime scene is outside), time of day and other factors into consideration
- Gather any needed forensic resources that might be needed to help the investigation

# Step 2: Investigating the crime

## 6) Preliminary survey/crime scene walkthrough

Finally after a lot of preparation before beginning the investigation, investigators conduct the preliminary survey or walkthrough of the crime scene. In this walkthrough the crime scene supervisor will create a pathway through the crime scene allowing for observation of evidence without contamination. Then during this walkthrough investigators will do the following:

- Evaluate the crime scene as to continue to piece together what crime was committed, how and by who
- Collect evidence and preserve evidence
- Take notes on the crime scene and the evidence collected
- Take photographs and make sketches
- Decide whether any additional equipment, services or personal are required to aid the investigation. E.g. specific specialists: blood spatter analysis, toxicologist, DNA equipment
- Key information about the crime scenes is also taken down, such as the position of furniture, room temperature, unusual smells.



# Step 2: Investigating the crime scene

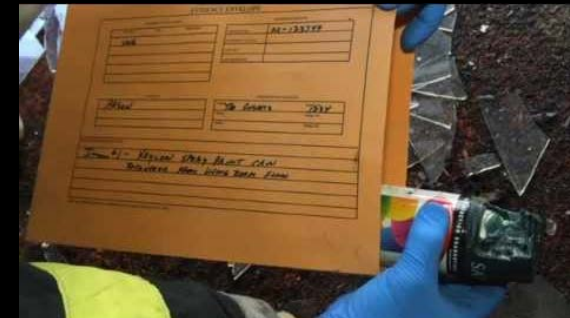
## 7) Scene search for trace evidence

Trace evidence is any material such as hairs, fibres, glass, soil, paint, fingerprints, etc. found at a crime scene on a person or object. Trace evidence is often used to link a person to the crime scene or another individual. Crime scene investigators are trained to be able identify trace evidence, recognise its value and relevance and finally properly collect and preserve the evidence. The following items are important to investigators in the process of searching for trace evidence:

- Flashlights/hand lanterns
- Studio light
- Vacuum

When trace evidence is found, it is photographed and documented with the following information:

- Location of the evidences discovery
- The type of material
- Amount of material collected
- Condition of evidence
- Controls or standards obtained, and locations from where obtained
- Packaging used for transportation of the laboratory



# Step 2: Investigating the crime scene

## 8) Types of fingerprints

Each human has a unique set of fingerprints making them a great way of linking a person to a victim or a crime scene. Fingerprints can be found on pretty much any solid surface, including the human body. There are three different categories that fingerprints can be classified by according to the surface they are found on and whether or not they are visible.

Fingerprints on soft surfaces (soap, wax, wet paint, fresh chalk, etc.) are likely to be **three-dimensional plastic prints**. Those on hard surfaces are either **patent** (visible) or **latent** (invisible to the human eye) prints. Visible prints are formed when blood, dirt, ink, paint, etc., is transferred from a finger to a surface.



## 9) Collecting fingerprints

- **Collecting patent prints:** The simple method of photography is used to collect patent prints. The prints are photographed using a high resolution camera and a forensic measuring scale in the image for reference.
- **Collecting latent prints:** as often seen on TV a common way of collecting latent prints from a crime scene is using a fingerprint powder to dust a surface, which then reveals the invisible prints. As well as being photographed when they become visible, latent prints are also lifted from the surface using clear adhesive tape and then placed on a latent lift card to preserve the print.





# Step 2: Investigating the crime scene

## 9) Collecting fingerprints



# Step 2: Investigating the crime scene

## 9) Scene search for biological evidence

Crime scene investigators may search the crime scene, other locations associated with the crime, and individuals associated, i.e. the victim and suspects for biological evidence such as blood, semen and spit.

When biological evidence is found it is sampled using a swab (which is then taken to the lab for further testing) and the location of the biological evidence at the crime scene is marked using pen, making sure it is not contaminated or missed as it is not always obviously visible.

When this evidence is collected the following notes are taken to allow for thorough testing:

- Whether an alternate light source was used to locate the stain
- Location of the stain
- Size of the stain
- Substances control sample location

