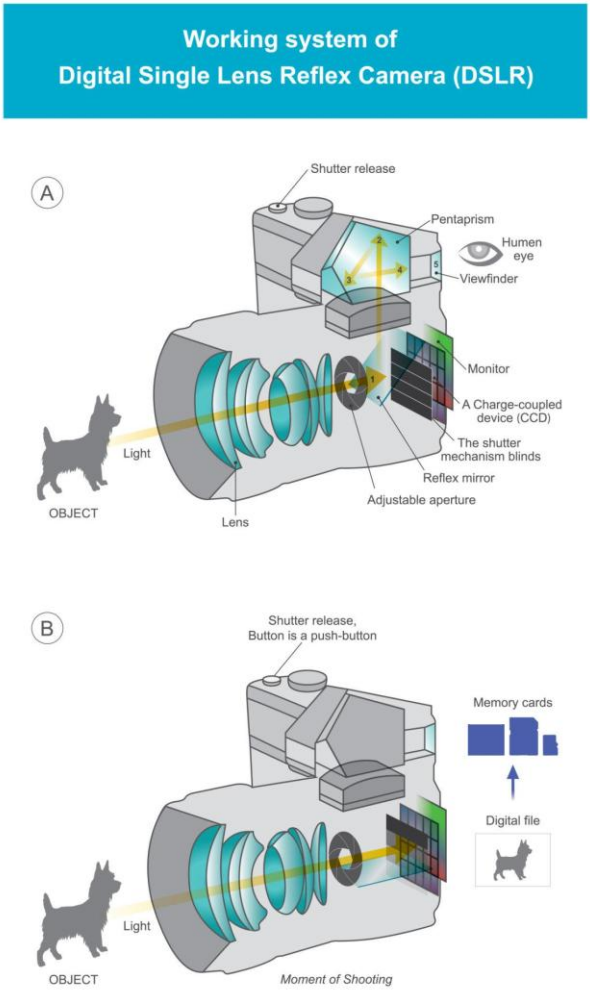
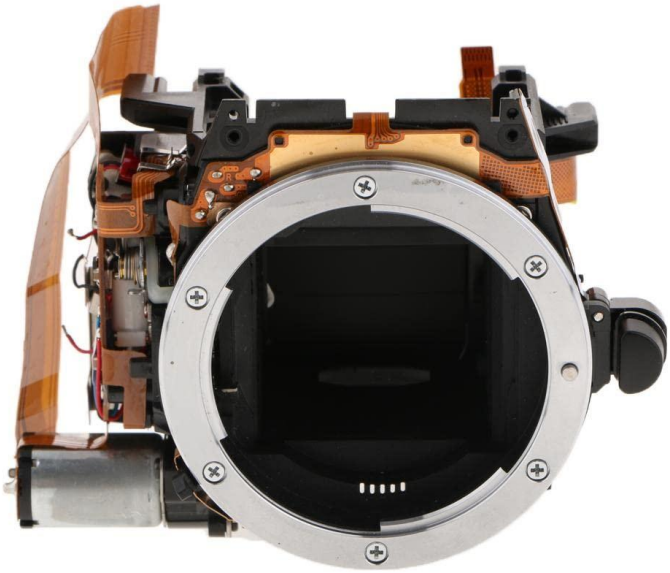
Parts of a DSLR Camera and Their Functions (with visual reference)

A **Digital Single-Lens Reflex (DSLR)** camera uses a mirror-and-prism optical pathway so the investigator views the scene through the same lens that captures the photograph. Light enters the lens, reflects from a mirror to the viewfinder for preview, and when the shutter is pressed the mirror lifts so light reaches the sensor and forms the image. (Techsight)
Because the preview and captured image share the same optical path, framing errors and parallax are minimized — an essential requirement in forensic documentation.

Internal Mechanism (how image is formed)





Inside the body, the **reflex mirror** sits at about 45°. While composing, it reflects incoming light upward to the focusing screen and pentaprism so the photographer sees the actual scene. When the photograph is taken, the mirror flips upward and the shutter opens, allowing light to strike the image sensor. (The Automotive India)

The **image sensor** then records the image digitally. Two main technologies exist:

- **CCD (Charge-Coupled Device):** moves electrical charge across the chip to one readout location. Produces uniform images with low noise but slower and consumes more power.
- **CMOS (Complementary Metal-Oxide Semiconductor):** each pixel has its own amplifier and is read individually, making it faster and more energy-efficient.

Modern DSLRs use CMOS sensors because they perform better in low-light and allow rapid documentation — useful when recording large crime scenes.

The **shutter** controls how long light reaches the sensor (exposure time). Faster shutter speeds freeze motion; slower speeds allow brighter images in dim areas.

Core Part	Function	Forensic Importance
Reflex mirror	Sends light to viewfinder, flips during capture	Accurate real-time composition
Sensor (CMOS/CCD)	Converts light to digital image	Records fine evidence detail
Shutter	Controls exposure duration	Prevents blur in documentation
Lens mount	Holds interchangeable lenses	Allows macro / wide-angle switching

Lens and Optical System

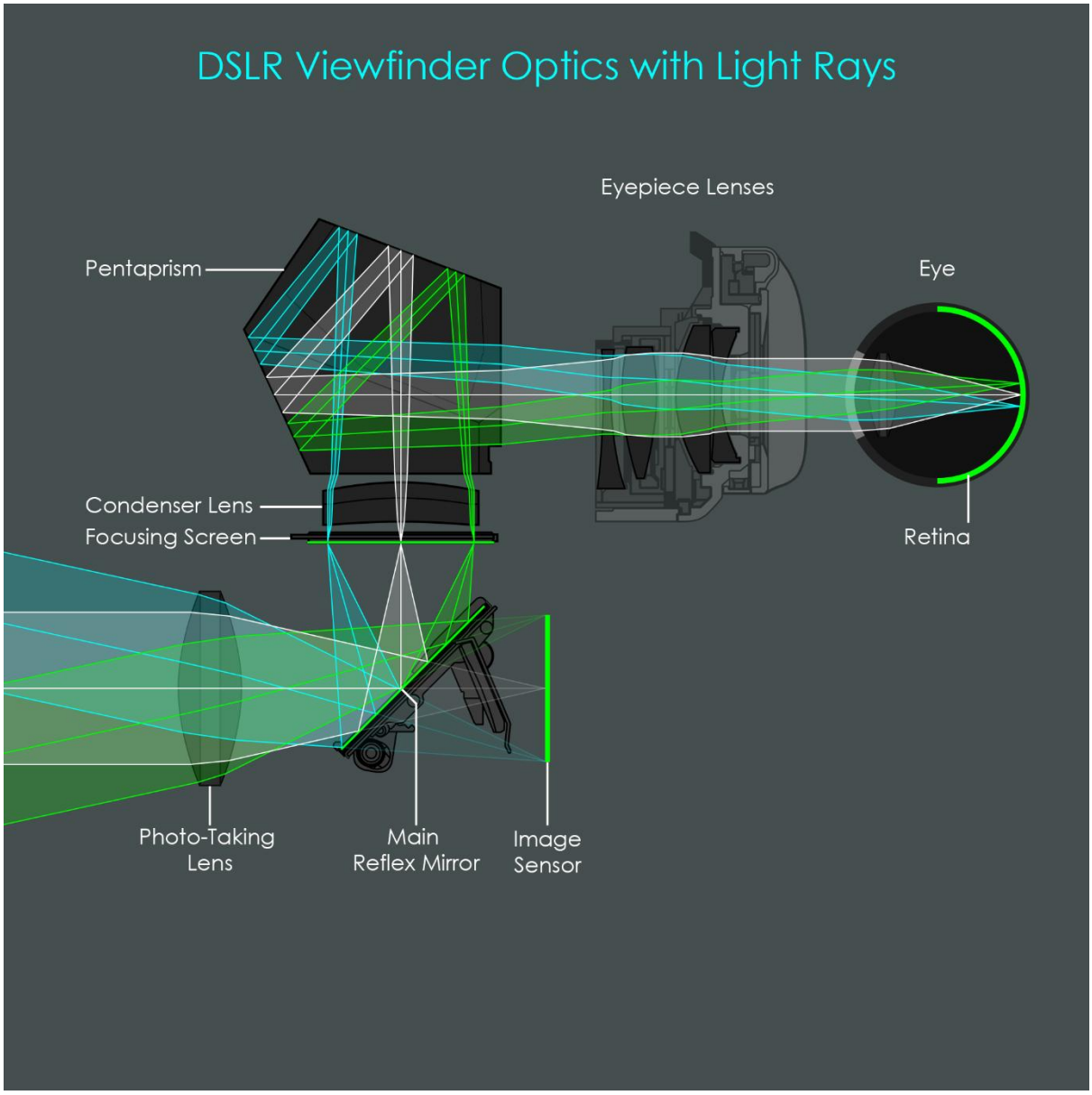
The **lens** focuses light onto the sensor. Different focal lengths are chosen depending on evidence type — wide-angle for overall scene, standard for mid-range, and macro for trace evidence.

Within the lens lies the **aperture**, an adjustable diaphragm controlling light intake and depth of field. Small apertures (large f-numbers) keep the entire evidence area sharp, which is preferred in forensic photography.

After reflection from the mirror, the image reaches the **pentaprism**, which corrects orientation so the investigator sees an upright and correctly aligned view. (exclusivearchitecture.com)
The **focusing screen** assists in confirming precise manual focus, especially useful in close-up documentation.

Optical Part	**Function**	**Forensic Use**
Lens	Focuses light	Different evidence types
Aperture	Controls light & depth	Sharp evidence edges
Pentaprism	Corrects orientation	Accurate framing
Focusing screen	Focus confirmation	Macro photography accuracy

Viewfinder and Camera Controls


DSLR Viewfinder Optics with Light Rays
Eyepiece Lenses
Pentaprism
Eye
Condenser Lens
Focusing Screen
Retina
Photo-Taking Lens
Main Reflex Mirror
Image Sensor

The **optical viewfinder** shows the real scene without digital delay, allowing precise placement of measurement scales and markers.
Pressing the **shutter button halfway** activates autofocus and metering; pressing fully captures the image.
The **mode dial** allows manual or priority shooting modes — manual settings are preferred for reproducible evidentiary photographs.

Control	**Purpose**	**Documentation Role**
Optical viewfinder	Direct optical preview	Precise alignment
Shutter button	Focus + capture	Focus lock before shot
Mode dial	Exposure selection	Standardized photographs
Metering system	Measures light	Prevents exposure errors

External Interfaces and Storage

The **LCD screen** enables immediate verification so evidence is not missed.
The **hot shoe** mounts external flash units used in oblique lighting for impressions and fingerprints.
Images are stored on a **memory card** (preferably RAW format for evidentiary integrity), and a **battery** powers long documentation sessions.

External Part	Function	Forensic Benefit
LCD screen	Image review	Instant verification
Hot shoe	Attach flash	Controlled lighting

Memory card	Store files	Original data preservation
Battery	Power supply	Extended scene coverage

Working Summary

Light → Lens → Mirror → Prism → Viewfinder (preview)
Mirror lifts → Shutter opens → Sensor records → Image stored

This optical-mechanical-digital workflow allows the DSLR to produce consistent, accurate, and legally reliable photographs — making it one of the most dependable cameras for forensic documentation.