

**Preparing & Presenting
Firearm Evidence
& the Ballistics Expert**

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Handguns

- Handgun: A firearm designed to be fired by one hand.
- Revolver: A handgun that has a rotating cylinder of multiple chambers containing bullets.
- Semi-Automatic Pistol: a handgun which uses the energy of one shot to reload the chamber for the next

Magazine

- Magazine: an ammunition feeding device for a firearm.
- May be detachable or internal.
- The magazine works by holding the ammunition into a position where it may be loaded into the chamber of a firearm.
- Most common source of malfunction.

Long Guns

- Handgun: A firearm designed to be fired from the shoulder by a single person
- Rifle: A long gun that shoots a single projectile through a grooved barrel.
- Shotgun: A long gun that generally shoots multiple projectiles through a smooth barrel.

Rifles

- Lever-action: A type of long gun that uses a lever located around the trigger guard to load a fresh cartridge.
- Bolt-action: A type of long gun in which the bolt is operated manually by the opening and closing of the breech with a small handle.

Shotgun



Ammunition



Muzzle Velocity

3 factors determine muzzle velocity:

- (1) The propellant
- (2) The mass of the projectile
- (3) The length of the barrel



Pistol vs. Rifle

The bullets are different:

Handgun bullets are short and fat

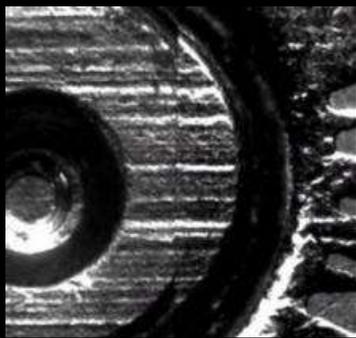
Rifle bullets are long and thin

Handgun: Muzzle velocities run about 750 FPS to 1,300 FPS.

Rifle: Muzzle velocities run about 1,900 FPS to 4,000 FPS.

The speed of sound is roughly 1,125 FPS.

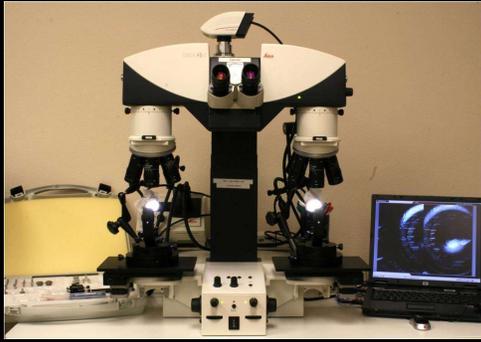
Firearms Identification



Firearms Identification



Comparison Microscope



Firearms Identification

Cartridge:

- (1) Cartridge Case
- (2) Primer
- (3) Propellant (Powder)
- (4) Projectile (Bullet)



Individual Characteristics



Individual characteristics are viewed at the appropriate microscopic level



Fired Projectiles



Firearms Identification

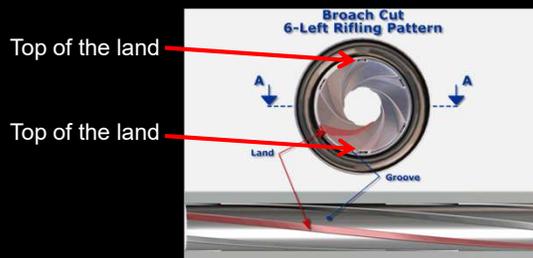
Class characteristics of fired projectiles:

- (1) Caliber
- (2) Number of Lands and Grooves
- (3) Width of the lands and grooves
- (4) Direction of twist of the rifling



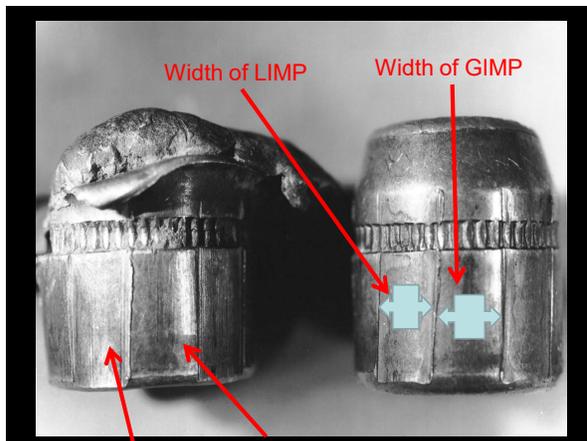
Firearms Identification

- The first class characteristic of bullets is caliber.



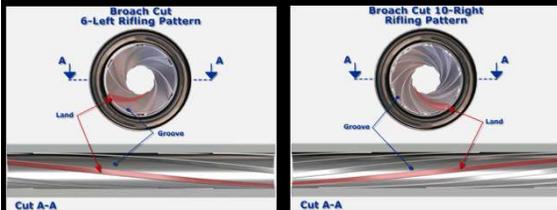
Firearms Identification

- The second and third class characteristics of bullets are the number of Land and Groove impressions and the width of these impressions



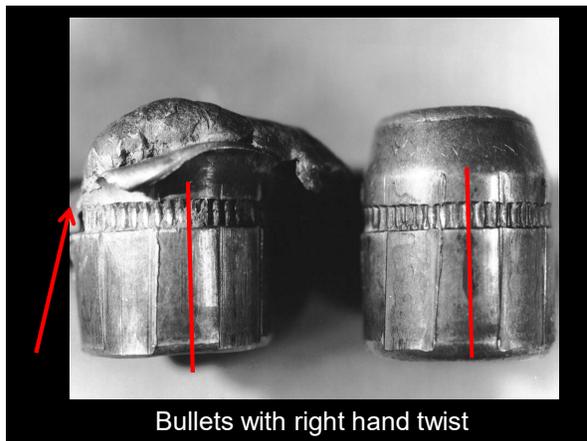
Firearms Identification

- The fourth class characteristic of fired bullets are the direction of twist of the rifling

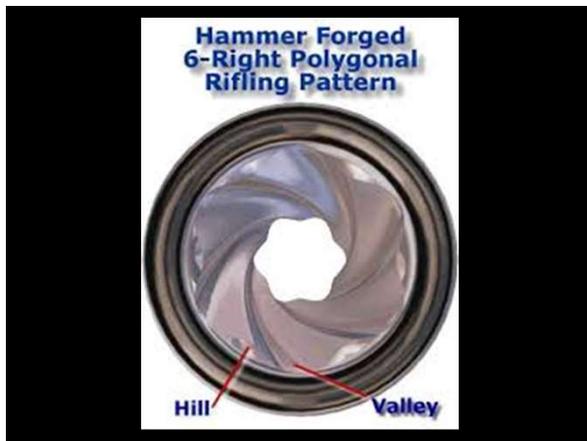


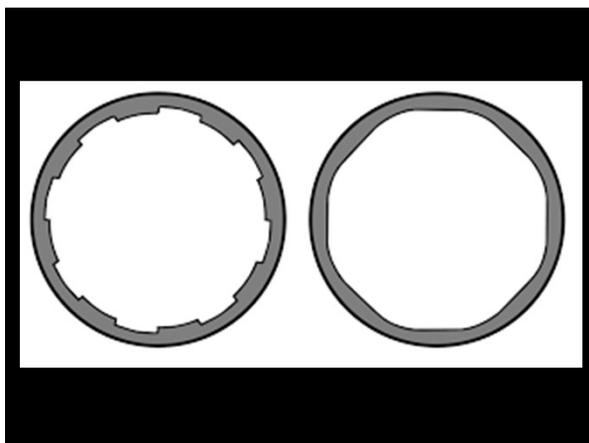
Left Twist

Right Twist



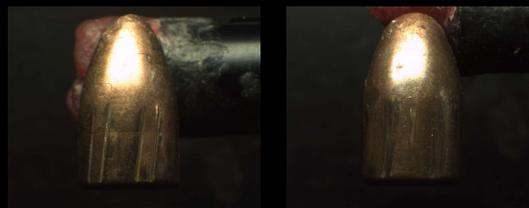
Bullets with right hand twist

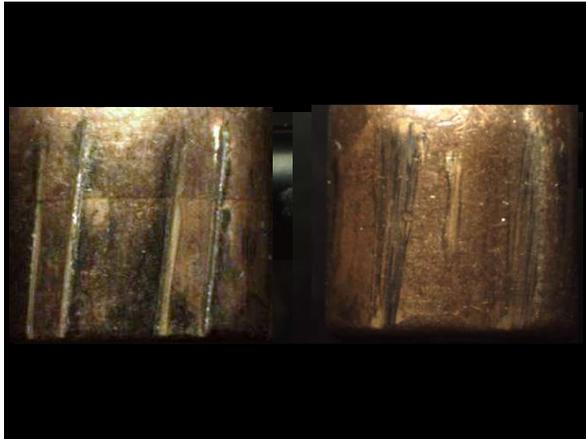




Firearms Identification

Another difference in rifling characteristics can be the method the barrel is manufactured.



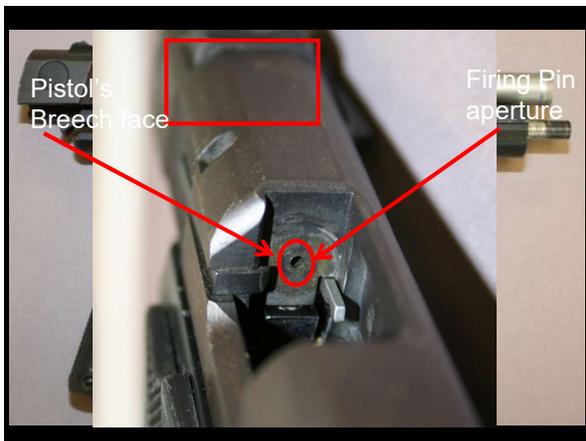
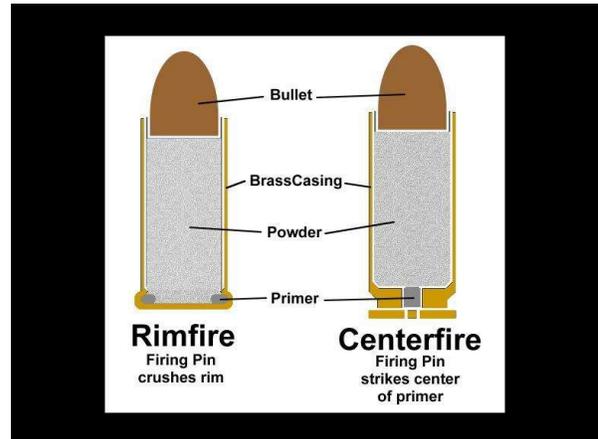


Firearms Identification

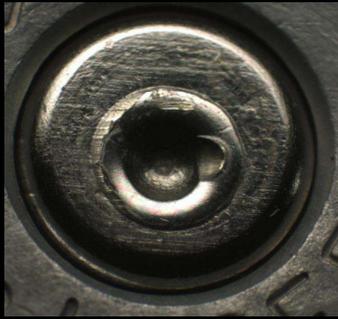
Class Characteristics of Cartridge cases:

- (1) Caliber
- (2) Firing Pin Impression Type
- (3) Breech Face Impression Type

Three small images showing different breech face impressions. The leftmost image is a Winchester primer with the text 'WINCHESTER' and 'AUTO' visible. The middle image shows a standard primer with a distinct firing pin impression. The rightmost image shows another primer with a different firing pin impression.

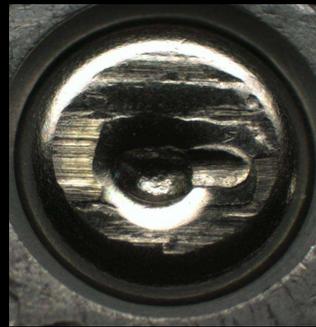


Firing Pin Impression Type:



Hemispherical

Firing Pin Impression Type:



Elliptical

Firing Pin Impression Type:

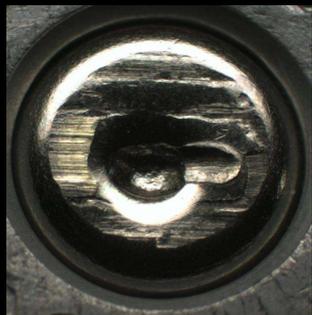


Rectangular

Breech face impression type



Breech face impression type



Parallel

Breech face impression type



Circular

Breech face impression type



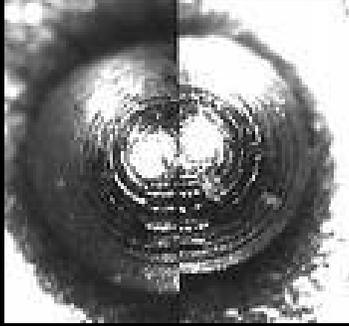
Arched

Breech face impression type



Parallel

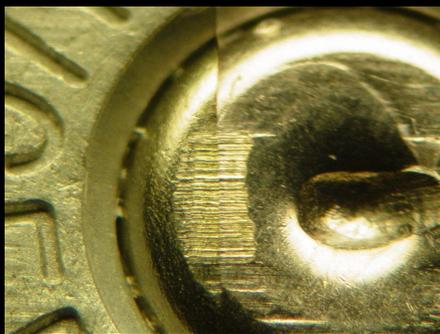
Firearms Identification-
Individual Characteristics



Individual Characteristics

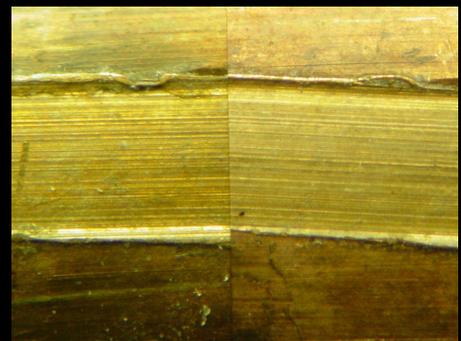


Individual Characteristics

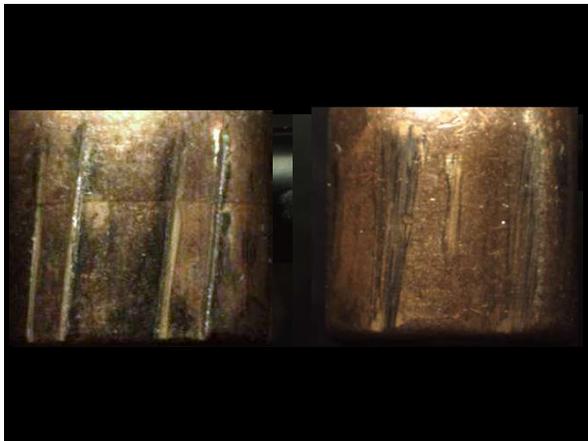


Breech face marks on a cartridge case

Individual Characteristics



Land impression on a bullet



The Rules of Firearm Safety

RULE I: *Treat all guns as if they are loaded.*

RULE II: *Never point the gun at anything you are not willing to destroy.*

RULE III: *Keep your finger off the trigger until you are ready to shoot.*

RULE IV: *Be aware of your target and what is behind your target.*

The Traditional Method

- Position in court is the same as every direct exam.
- Qualify the expert.
- Ask to approach.
- Work with the exhibits individually.
- Elicit the expert's conclusions.



The Darman Method

- Meet with your witness in the courtroom.
- Notify defense.
- Let the judge know.
- Open and arrange all of the evidence.
- Think infomercial.



The Darman Method

- PowerPoint during qualification.
- Qualify the expert.
- Ask for the expert to step off the stand.
- Work with the exhibits in front of the jury.
- Elicit the expert's conclusions.



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