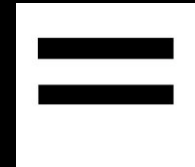
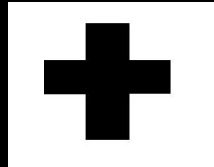
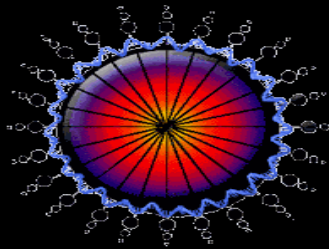


# BALLISTICS and FORENSIC SCIENCE



By: Amanuel Wubetu &  
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# WHAT IS BALLISTICS?

- The study of the movements and forces involved in the propulsion of objects through the air.
- The study of firearms and ammunition.

# THE DEVELOPMENT OF BALLISTICS

- The first case involving tracing a bullet wound back to a suspect occurred in 1794 when a surgeon removed and preserved a wad of paper from the gunshot wound which had killed a Lancashire man, Edward Culshaw.
- When the paper was unfolded, it was found to match the missing torn-off corner of a ballad sheet still in the pocket of the suspect John Toms.

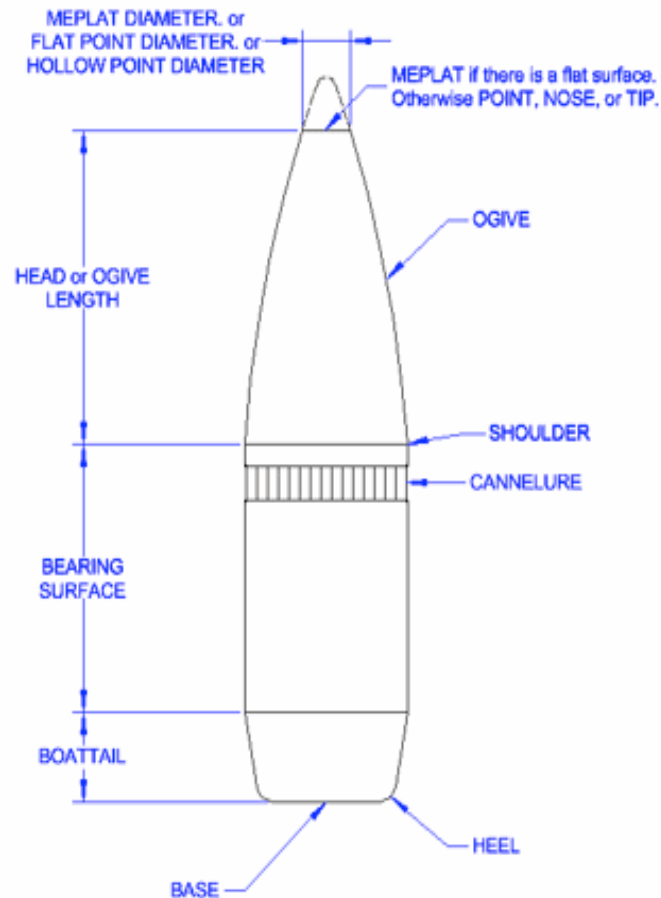


# THE DEVELOPMENT OF BALLISTICS CONT.

- A similar case occurred on 24 October 1860, when PC Alexander McBrian, a police officer in Wyberton, Lincolnshire, was shot by Thomas Richardson, a suspected poacher.
- The wadding found at the scene of the crime was compared with the paper in the other, undischarged, barrel of the suspect's double-barrelled shotgun recovered at his home.
- They were both found to have come from the very same page of *The Times* newspaper of 27 March



# HOW IS BALLISTICS RELATED TO FORENSIC SCIENCE?



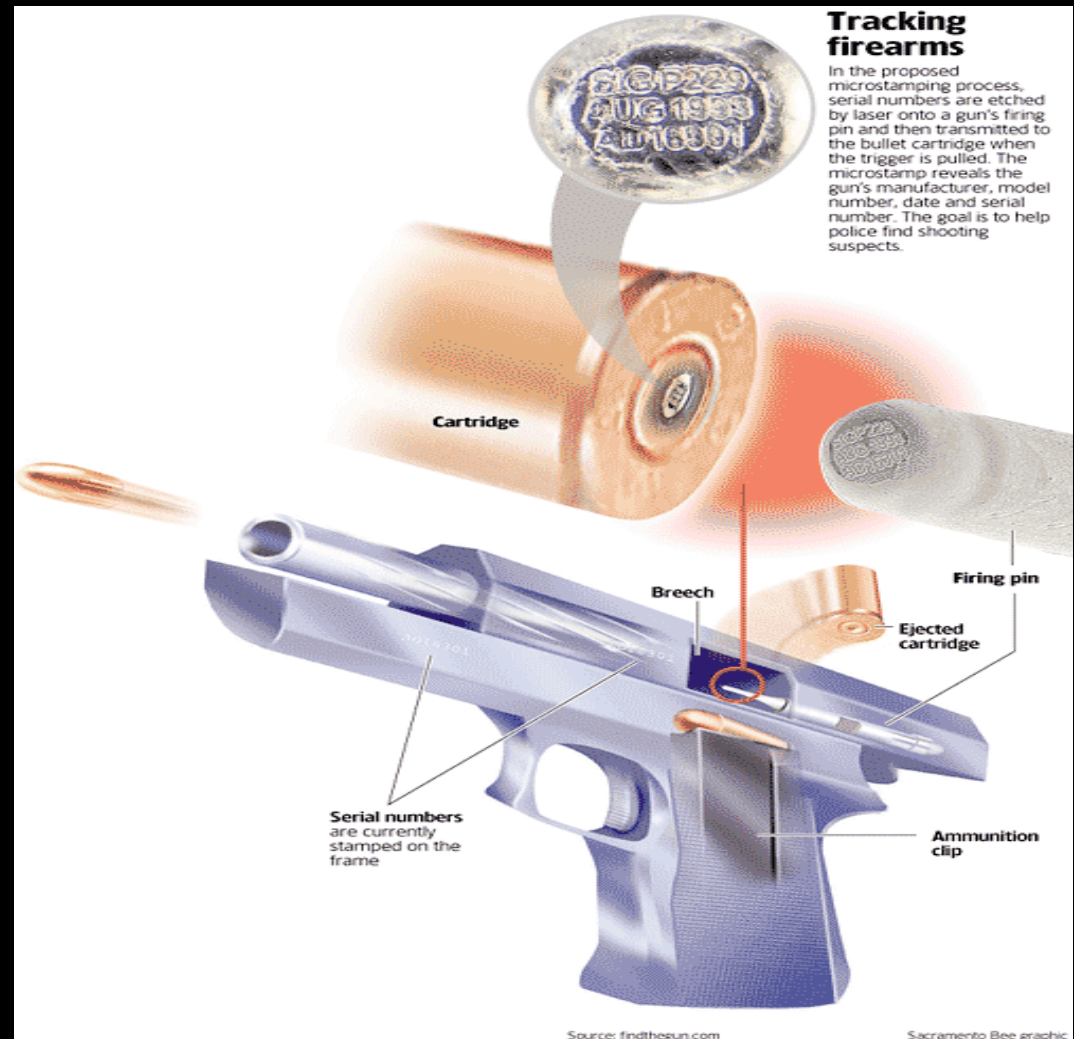
- Ballistics is a special subject rare of the forensic science field because it can be used to determine what type of firearm was used in a crime. This of course involves hours of analysis at the crime scene and in forensic labs.

## HOW DOES FORENSIC BALLISTICS WORK?

- Forensic Ballistics involves the examination of bullets and firearms in an attempt to identify particular weapons used in a crime.

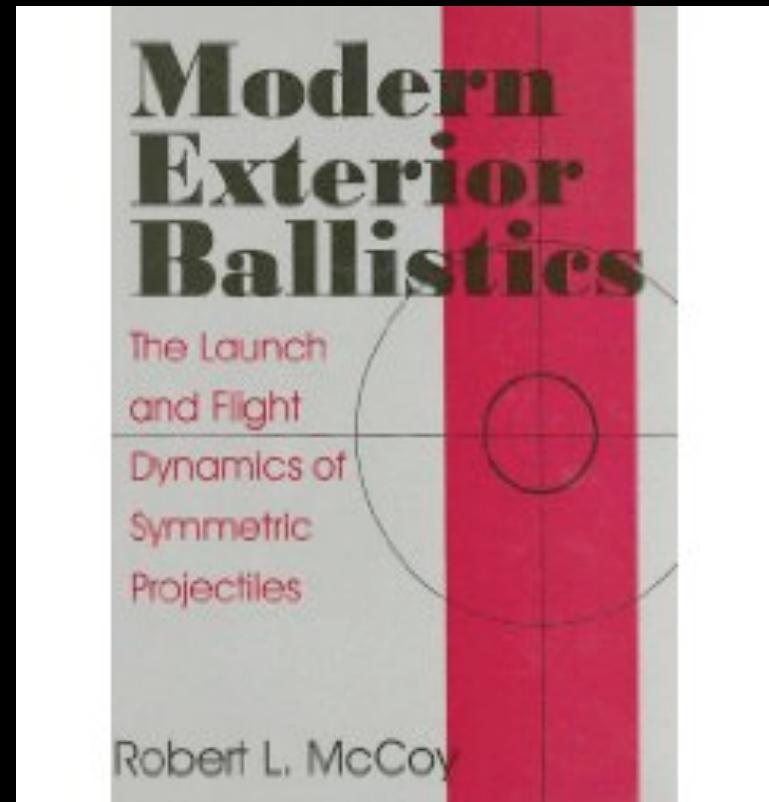
# TYPES OF BALLISTICS

- Internal ballistics is what happens inside a weapon when it is fired. The explosive pressure causes the bullet to expand slightly to fill the spiral rifling grooves cut in the bore.



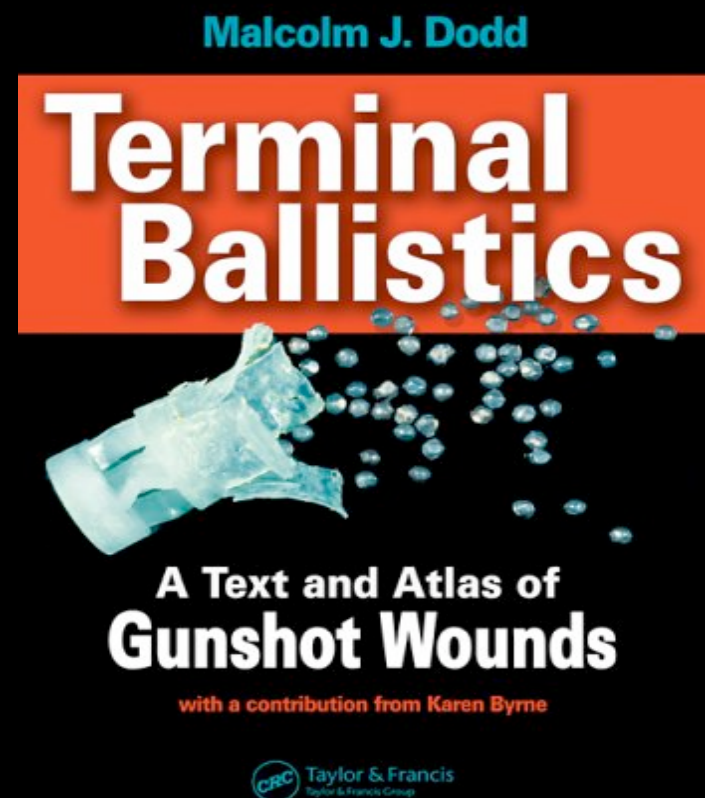
# TYPES OF BALLISTICS

- External Ballistics is what happens to the bullet and residues outside the gun, including the direction & velocity of the shot, as well as any deviation in the trajectory.



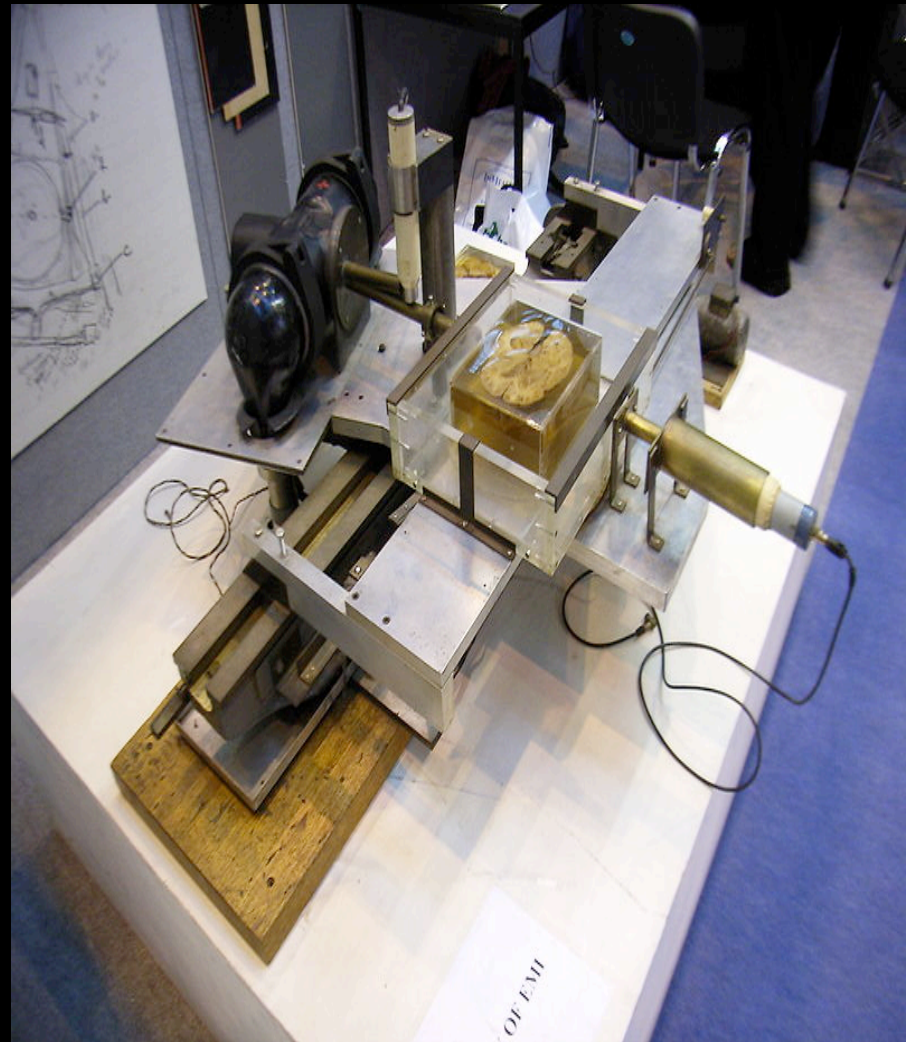
# TYPES OF BALLISTICS CONT.

- Terminal ballistics looks at the changes in trajectory and speed caused by ricochet and penetration of objects, as well as the layered deposits on parts of the bullet accumulated as its contacts these objects.
- Terminal ballistics includes examination of the shape of wounds and the extent of tissue damage.
- If a bullet cannot be removed for examination, its caliber can be measured by CT scanning.



## What is CT SCANNING?

- **Computed tomography (CT)** is a medical imaging method employing tomography. Digital geometry processing is used to generate a three-dimensional image of the inside of an object from a large series of two-dimensional X-ray images taken around a single axis of rotation.



# BALLISTICS FINGERPRINTS

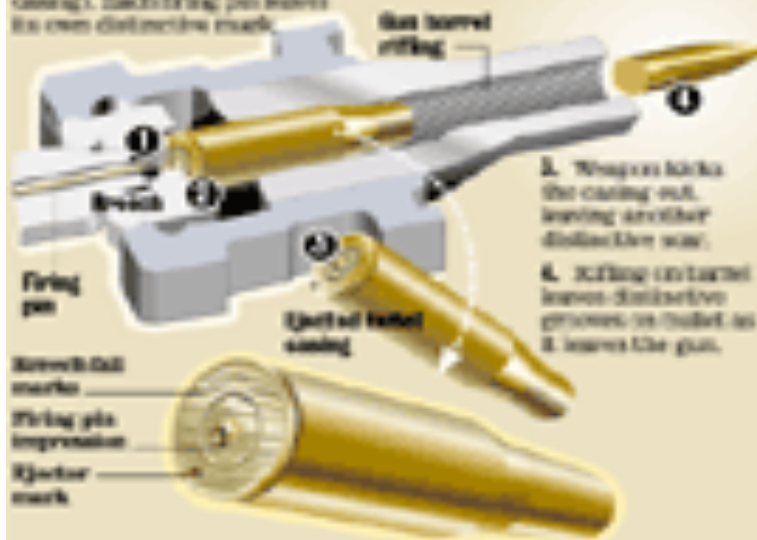
## *'Ballistic fingerprint'*

Legislation before Congress would require firearms manufacturers to test fire each weapon and record the distinctive marks etched on bullets and cartridges as they are fired

### Life firing mechanism

1. When trigger is pulled, firing pin punches into back of cartridge casing and casing. Each firing pin leaves its own distinctive mark.

2. Recoil slams cartridge back against breech, leaving "breach face" marks.



3. Weapon kicks the casing out, leaving another distinctive mark.

4. Rifling in barrel leaves distinctive grooves in bullet as it leaves the gun.

Primer mark  
Firing pin impression  
Primer mark

■ A national database of ballistic fingerprints matched with gun serial numbers might help investigators track down a weapon's manufacturer and original purchaser.

- A ballistic fingerprint is the unique pattern of markings left by a specific firearm on ammunition it has discharged.
- Ballistic fingerprints are used in forensic science to match a bullet retrieved from a victim to a specific gun.

# What do Forensic Ballistics Experts do?



- Forensic Ballistics experts look at certain characteristics of firearm that relate to the bullets fired from there including the caliber of the firearm and; the rifling pattern contained in the barrel of the firearm.
- Cartridges and Cartridges cases on the other hand are examined for similarities in what are called breech marks and other named tool marks.
- One of the most important tools in forensic ballistics is the comparison microscope where these tool marks may be visually compared side by side and matched or eliminated

# Examination Methods

## . Cartridge comparison Stereo

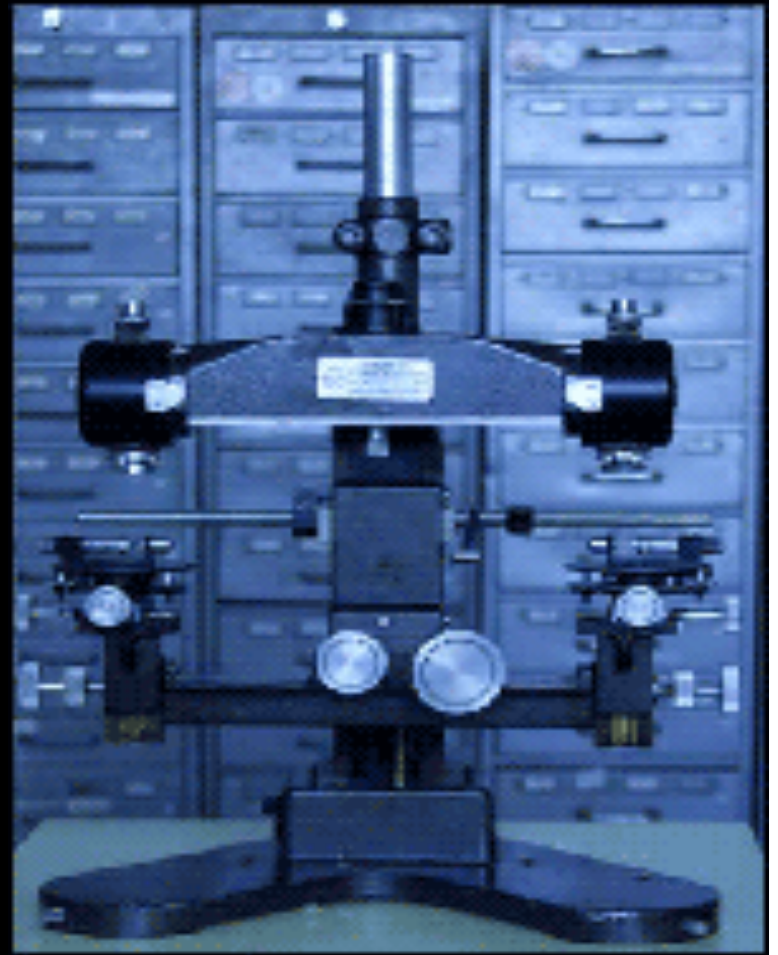
### Microscope :

This method is used in the examinations of cartridges from crime scene and cartridges for comparison under the light coming through different angles and under various enhancement rates. It is also used in scans through crimes the doer of which are not known.

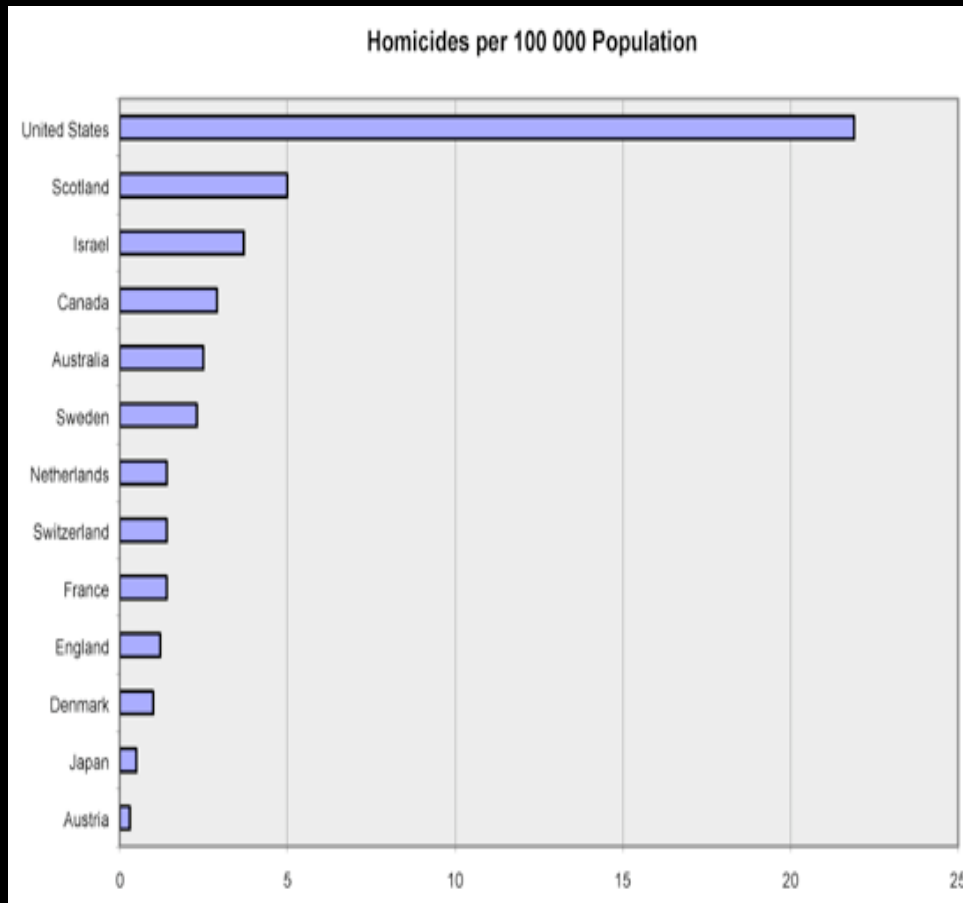


## Examination Methods Contd.

**.Comparison Microscope:**  
It is used in the examination of cartridges from crime scene and cartridges for comparison.



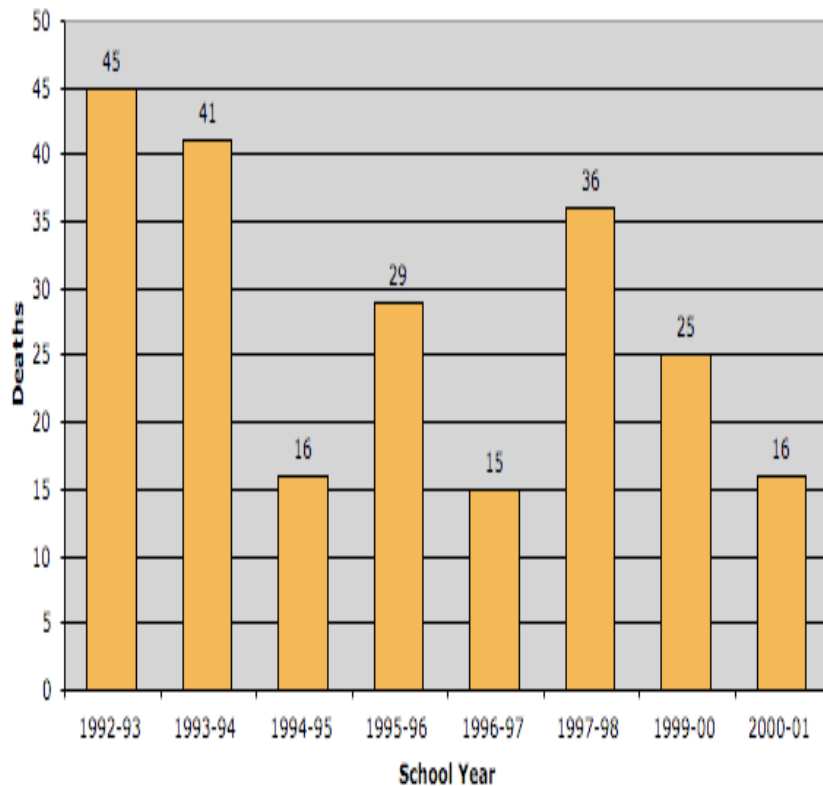
# The Social Importance of Gun Violence Statistics



- There have been 11,789 murders each year in the United States due to gun violence.
- Among 26 industrialized nations, 86% of gun deaths among children under the age of 15 occurred in the United States.
- Taxpayers pay more than 85% of medical cost for treatment of firearm related injuries.

# Gun Violence Statistics Cont.

School Associated Violent Deaths by Firearm



- In a 19 year time span (1977-1996) the firearm industry produced 85,644,715 firearms.
- More than 10 children, and teenagers 19 and under, are killed by guns **EVERYDAY**, and many more are wounded.
- Of the 24,950 juveniles ages 12-17 who were murdered annually between 1980-2000 12,880 were black (52%) and 11,270 were white (42%). The remaining 620 murdered were combined as American Indian, Alaska Native, Asian, or Pacific Islanders.

# THE ADVANTAGES OF BALLISTICS INVESTIGATION

- In many cases, ballistics has helped to find criminals and put them away for good. In 1997, the National Integrated Ballistics Identification Network, established by the Federal Bureau of Investigation (FBI) and the Bureau of Alcohol, Tobacco, and Firearms (ATF), made 8,800 ballistic fingerprint matches, which resulted in the linking of 17,600 crimes.

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THANK YOU!



Any Questions?!?!?!?!?!?

OH YEAH!!!

