





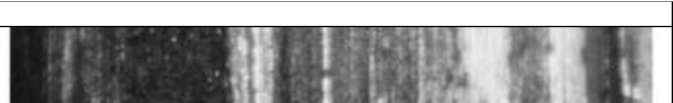





Ballistics

Complete the worksheet BEFORE we do we do notes in class

Match the terms to the definitions using the striations as a guide

The study of projectiles and firearms	
The path of flight of a projectile	
Measure of the inside of the firearm barrel	
A weapon capable of firing projectiles using explosives	
Tiny particles expelled from a firearm when fired	
Case that holds a bullet, primer, and gun powder	
The spiral pattern inside the barrel of a gun	
Black explosive discovered by Chinese alchemists	
The projectile launched from a fire arm	
	

Ballistics

Learning Objectives:

- ☐ I can explain the discovery of gun powder
- ☐ I can explain how bullets are test fired and matched
- ☐ I can determine the position of a shooter based on bullet trajectory

What is Forensic Ballistics

The scientific _____
all _____ with the
purpose of interpreting and establishing the facts in a shooting related crime



Where was gun powder first created?

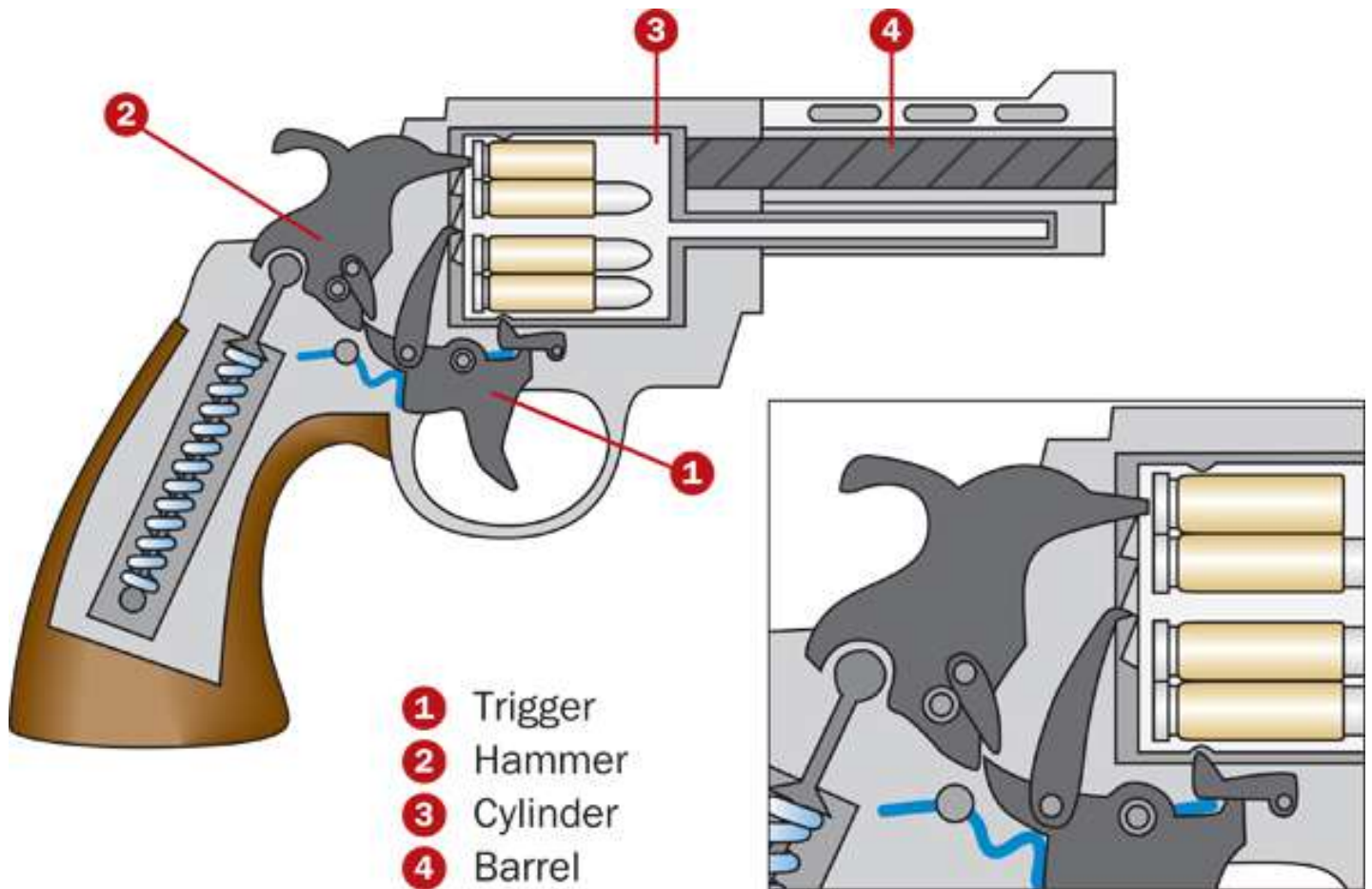
What were the alchemists trying to create?

What was gun powder first used for?



Who brought gun powder to Europe?

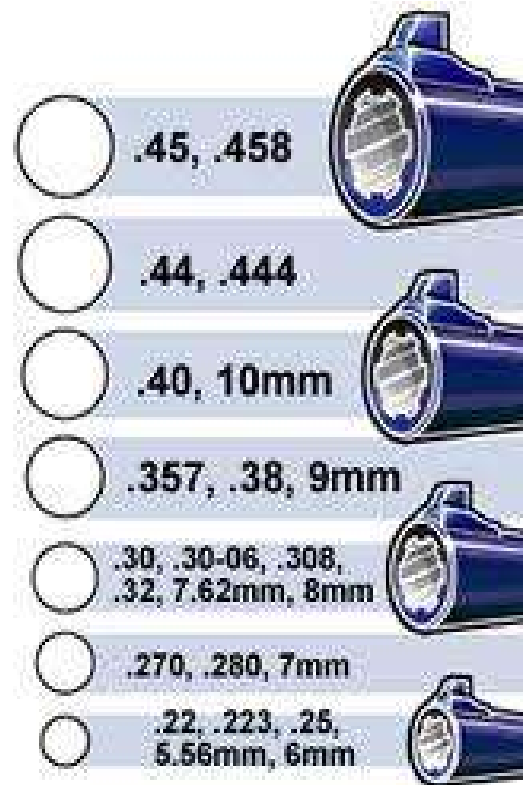
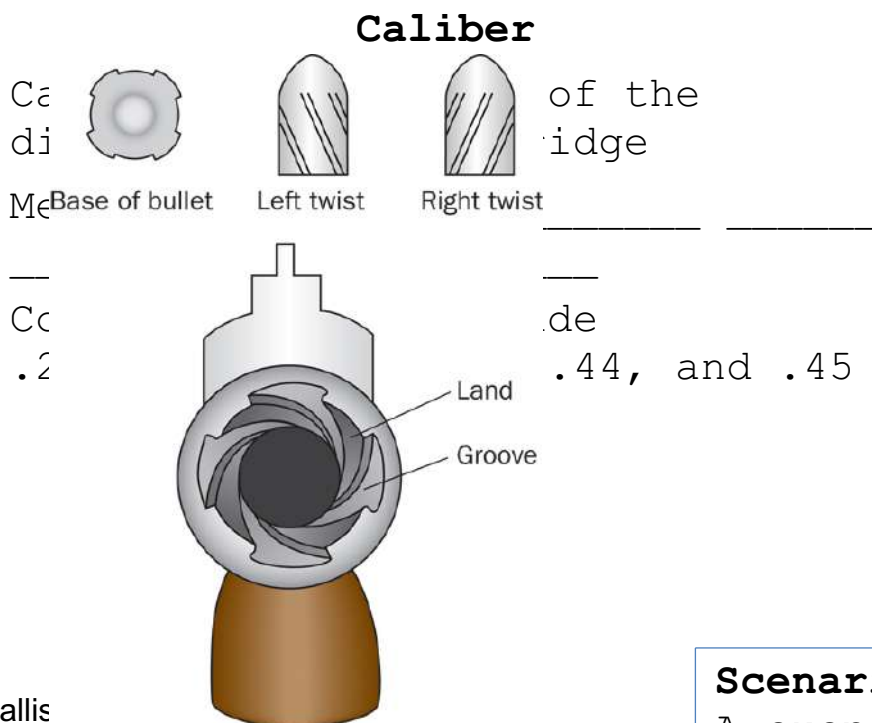
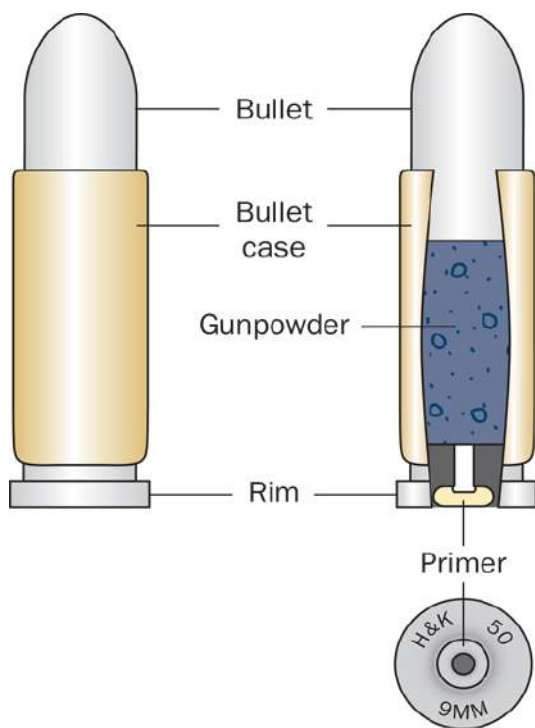
How does gunpowder explode?



How Firearms Work

1. The _____ hits the base of the cartridge, _____ the _____ powder.
2. The primer powder sparks through the flash hole to the main _____ supply
3. The pressure of the _____ from the casing into the barrel
4. The bullet follows the lands and grooves _____ out of the

Anatomy of a Cartridge



Scenario

A suspect was named in a homicide case. Two guns were collected from the

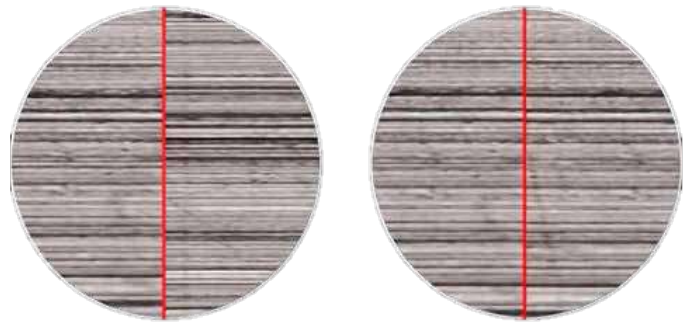
Rifling and Striations

Grooves and ridges in the barrel causes the bullet to spin, making aim more

_____.

This creates

_____ that can
match a bullet to a
particular gun



Gunshot Residue

Particles of unburned powder and traces of smoke are left on the

_____, _____, _____, _____, or
_____ of the shooter and/or victim

Chemical testing can detect residue even if removal is attempted

Distance from victim to shooter can be determined by examining the residue pattern on the victim

Trajectory

Two reference points are needed to define the trajectory. Reference points can be

- Bullet holes in objects or victims
- Entry and exit points on a victim
- Gunshot residue or spent casings

The path of a bullet can be traced with lasers or calculated mathematically

Pythagorean Theorem: _____

$\sin =$ _____

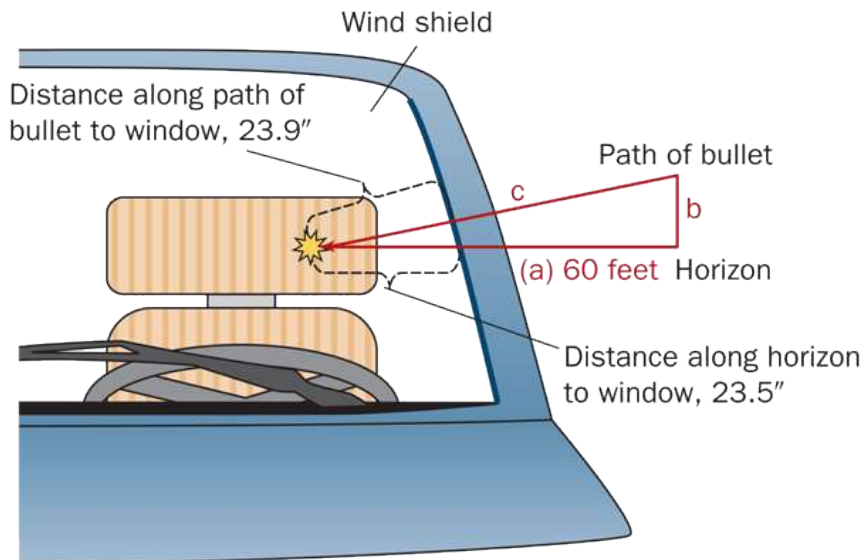
$\cos =$ _____

$\tan =$ _____

Scenario

A rifle was shot from a nearby building through the windshield of a car and hit the drivers side seat.

- If the bullet struck at an angle of 23.9° from a building 60 feet away, what floor of the building was the bullet shot from? Assume each floor is 10 ft tall.
- If the bullet travels at 2,500 ft/s, how long does it take for the bullet to hit the victim?
 $V=d/t$



Death

Complete the worksheet BEFORE we do we do notes in class

1. Cooling of the body after death

Scrambled: astrolgmori

Answer: _____

2. The immediate reason for a person's death (such as a heart attack)

Scrambled: cdesoehatauf

Answer: _____

3. Cessation or end of life

Scrambled: hedta

Answer: _____

4. The process of rotting and breaking down

Scrambled: psinoeoctmoid

Answer: _____

5. The study of insects

Scrambled: meongytolo

Answer: _____

6. Immature form of an animal that undergoes metamorphosis, such as a bot fly

Scrambled: arvla

Answer: _____

7. Pooling of blood after death resulting in a reddish color to the skin

Scrambled: trmivlisoor

Answer: _____

8. One of four means by which someone dies (natural, accidental, suicidal, homicidal)

Scrambled: ademtrohnanfe

Answer: _____

9. Stage in an insect's life when the larva forms a capsule around itself before emerging in its adult form

Scrambled: apup

Answer: _____

10. Stiffening of the skeletal muscles after death

Scrambled: rimorgoirts

Answer:

Death

Learning Objectives:

- ☐ I can explain the composition and function of blood
- ☐ I can determine blood type from a sample of blood.

Investigating Death

When the cause of death is unclear or suspicious an investigation is completed by a medical examiner or coroner. This includes:

- _____ crime, suicide, or accident
- Within 24 hours of entering a _____ or having surgery
- A natural death when a patient is _____
_____ the care of a _____ or medical facility
- Death in _____ or correctional facilities
- Death from a communicable _____ that may pose a threat to public health.

At the Death Scene

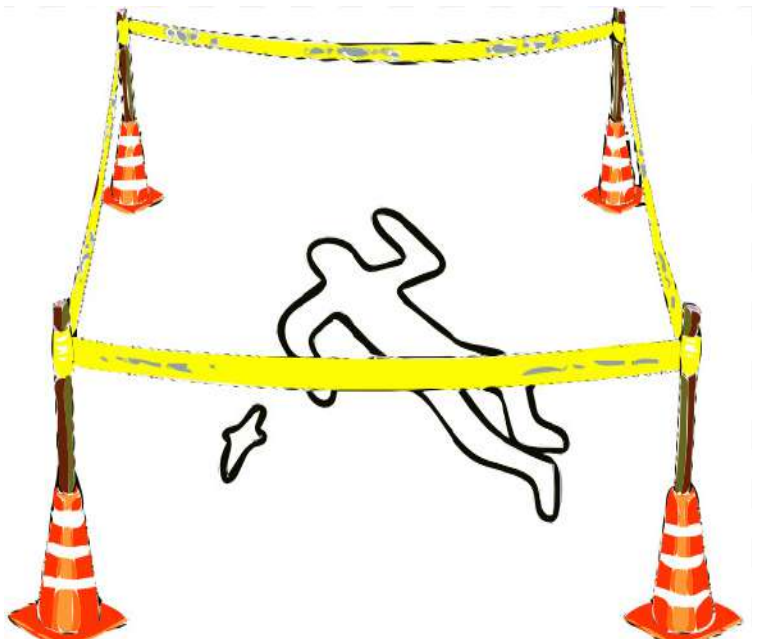
Draw _____ of the body at the scene

Take _____ of

- the scene
- the victim's face
- the underside of the body

Document signs of _____

Estimate _____



Collect _____ and establish chain of custody

Medical Examination

Update _____

Investigate clothing and body

Search for biological and nonbiological

Order _____ and perform an
_____ to confirm time of death

Determine _____
_____ (natural, accidental, homicide,
suicide, or unknown)

Identify _____
_____ (specific injury or disease
resulting in death)



Evidence Collected During the Autopsy

_____ In order to identify the victim blood is collected from an artery and placed on a blood card for DNA profiling

Dried blood is scraped into a test tube using a scalpel or swabbed with a Q-tip

_____ Semen is swabbed with a Q-tip and DNA profiled

_____ Loose hairs are collected, noting where it came from, and compared to the victims own hairs, follicular tags provide DNA evidence

_____ Tissue samples are collected in individual sterile containers and stored in a cool area such as a refrigerator

May be used to detect cancer and disease

_____ Each fingernail is trimmed and placed in its own labeled sterile envelop

_____ A forensic odontologist may be brought in to take dental records and study bite marks.

Bite marks will also be swabbed for DNA with a moist Q-tip which is then dried and placed in a test tube

Laboratory Analysis

- _____ — the science related to the detection of drugs, alcohol, and poisons
- _____ — the study of tissues
- _____ — the study of disease and trauma associated with the nervous system
- _____ — the study of blood, semen, and other body fluids (for legal matters)

Estimating Time of Death

Livor Mortis - _____

Blood settles into the lower parts of the body

Lividity begins about _____ after death, discoloration becomes permanent after _____

Can help determine the position of the body during the first eight hours after death

Rigor Mortis - _____

Calcium accumulates in the muscles after _____ causing the body to become stiff

By _____ muscle tissue deteriorates causing the stiffness to disappear

Algor Mortis - _____

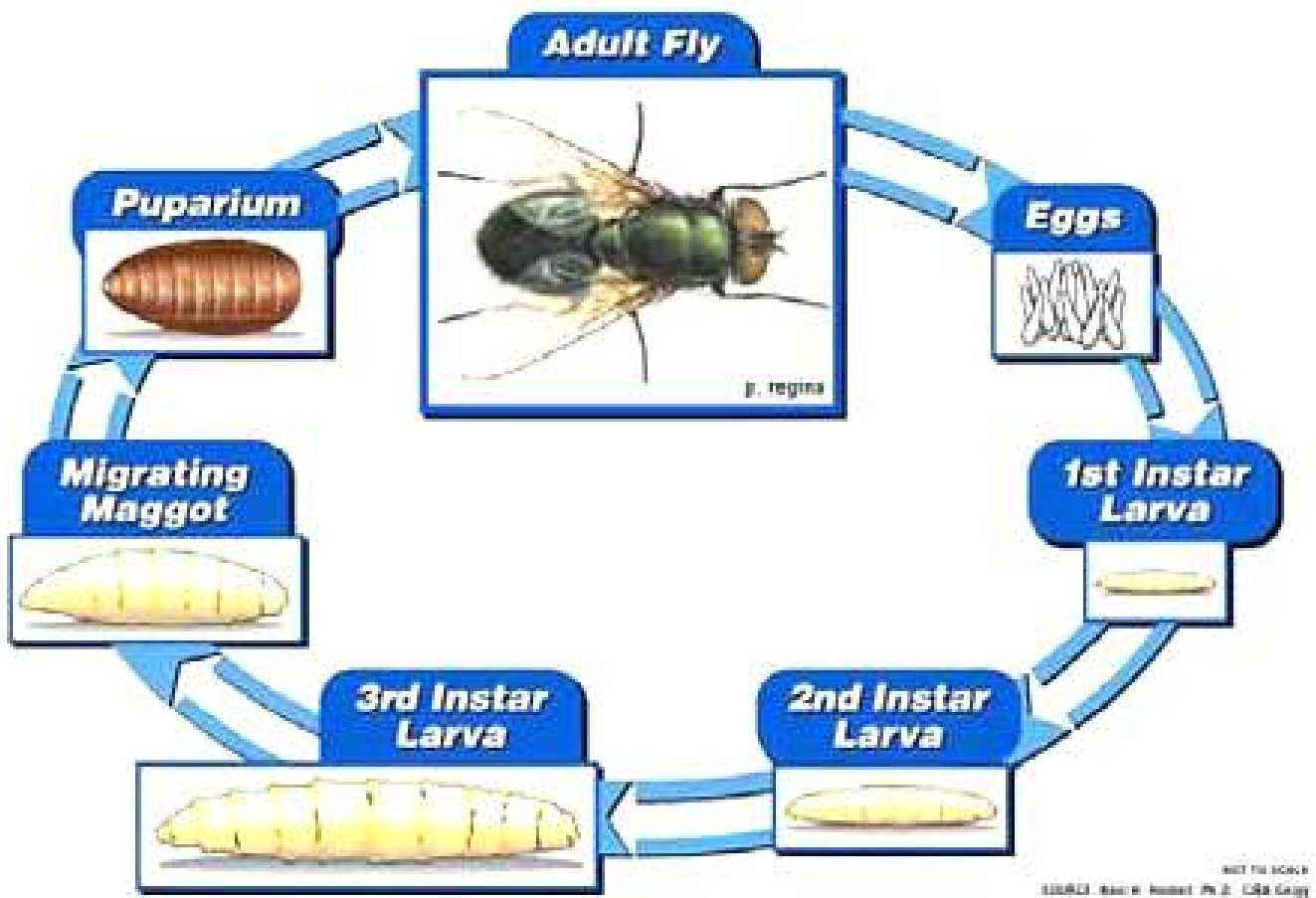
Body heat falls _____ per hour slowing to less than _____ after about 12 hours depending on environment





Corpse temperature is measured by a thermometer inserted into the liver




Time of death is expressed as a range of time

Blow Fly Life Cycle

- _____ – eggs are found in moist areas of the body
- _____ – stage 1 larva, thin body, black mouth
- _____ – stage 2 larva, dark crop becomes visible, actively feeding
- _____ – stage 3 larva, dark crop disappears, fat body
- _____ – Pre-pupa, larva migrates away to dry areas
- _____ – Pupa, immobile, does not feed, dark brown “balloon”
- _____ – adult blow fly, incapable of flight for first few hours



Rifling	
Gunshot Residue	
Ballistics	
Cartridge	
Firearm	
Gun Powder	
Caliber	
Bullet	
Trajectory	

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