Chapter Eight

Muzzleloader Equipment

Goal: To promote safe participation in hunting activities by introducing basic firearm and hunting safety principles and practices.

Lesson 1: Varieties of Muzzleloaders

Objective

In this lesson you will:

- Identify the different types of muzzleloaders in common use by hunters.
- Recognize safety procedures for muzzleloader hunting.

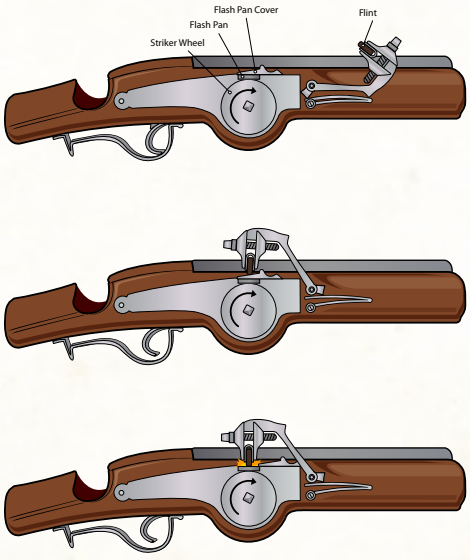
The muzzleloader is a firearm that is loaded through the muzzle—the front end of the gun barrel. Muzzleloaders preceded today's modern, breech-loading firearms. The "breech" of a firearm is the end of the barrel that is opposite the muzzle end.

Most states and provinces have special hunting seasons for muzzleloaders, which provide more hunting opportunities. Interest in muzzleloader hunting has increased in the last three decades.

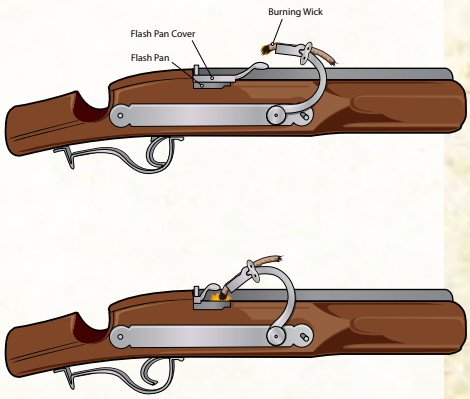
Brief History of the Muzzleloader

Ancient manuscripts reveal that muzzleloader firearms first came into existence in the 1400s. (The Chinese had invented gunpowder 700 years earlier.) These early muzzleloaders resembled small cannons that were light enough for one or two people to carry. Their design was simple. They consisted of a long iron tube or barrel to hold the powder and bullet. The barrels were open on the front and closed on the back. A touchhole at the back was for firing a powder charge. A primitive stock made of a slab of wood and attached to the barrel provided balance and control for aiming the gun.

The development of gun firing systems is an interesting chapter in the history of hunting and firearms. Prior to the modern era, European inventors produced many varieties of firing systems including the matchlock and wheel lock.



Wheel Lock



Matchlock

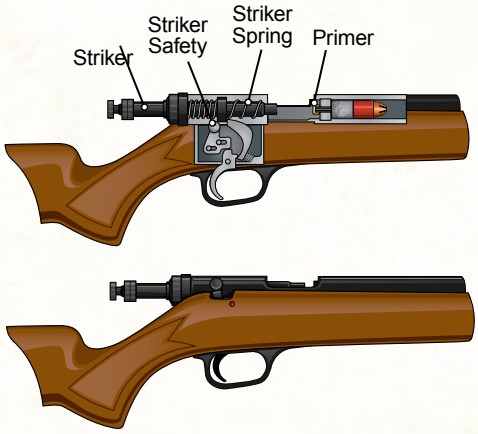
Some, such as the matchlock, were reliable if the weather was dry. Other firearm actions, such as the wheel lock, had complex

designs, which made them expensive to buy and maintain. Only nobility could afford to purchase them. Historically, hunting with a firearm was not possible for common people until gun firing systems became:

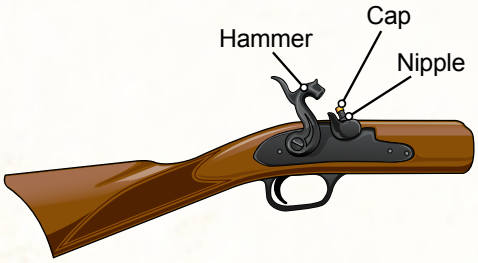
- Simple
- Reliable
- Easy to clean and repair
- Low-priced

The classification of a muzzleloader is by its firing system. Today, these three types of muzzleloaders are popular among hunters.

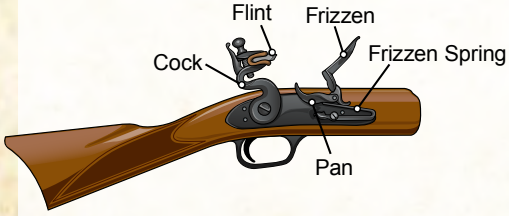
Modern inline



Percussion



Flintlock



Today's muzzleloader hunters have several options when it comes to choosing hunting equipment, which makes this kind of hunting challenging and interesting.

- Some hunters prefer a fully modern system, with an inline muzzleloader and all modern ammunition and accessories.
- Other hunters combine modern and traditional equipment. They can choose to use a reproduction muzzleloader rifle with a flintlock or percussion system, and an assortment of modern and traditional ammunition and accessories.
- Another group, called traditional muzzleloader hunters, prefers to hunt using the same equipment and clothing used in the 1600s to the mid-1800s. Typically, traditional muzzleloader hunters also make their guns, ammunition, accessories and clothing.


Muzzleloader accessories

Modern Inline Muzzleloaders

In 1985, Tony Knight created the first modern inline muzzleloader.


Modern Inline Muzzleloader

This type of muzzleloader soon became popular among hunters.

The modern inline muzzleloader is a bolt action or hammer inline ignition system. It is designed to fire black powder or black powder substitutes in premeasured loose grains or pellets and saboted bullets. The action has a safety to prevent unintended firing of the gun. It operates similar to safety devices on modern breech-loading guns.

What distinguishes the modern inline from traditional muzzleloaders is the firing system (and nipple) is in a direct line behind the powder charge. With a pull of the trigger, the firing mechanism strikes the percussion cap, which sends sparks directly into the rear of the breech, firing the powder. The modern inline muzzleloader may produce a faster powder ignition than traditional muzzleloaders.

Also, since the percussion cap on the inline is inside the action, it is relatively safe from rain and snow, making it more likely to fire than a traditional muzzleloader.

The inline muzzleloader is available in .45, .50 and .54 caliber barrels, with the .50 caliber being most popular.

A modern inline muzzleloader may have a synthetic stock in black or a camouflage finish, and a thumbhole. Often, the action and barrel of an inline are made of stainless steel or are nickel coated. In addition, it may be equipped with standard front and rear sights or a scope.

The earliest inline muzzleloaders used the #11 standard percussion caps. Later inline muzzleloaders began using more powerful percussion caps to improve ignition, including the musket cap, #11 magnum percussion cap and #209 shotgun primer.

Inline muzzleloaders are available in four different firing systems:

- **Plunger:** operates on a spring mechanism that is controlled by the trigger. When the trigger is pulled it releases the plunger to slide forward, strike the percussion cap and fire the gun.
- **Bolt Action:** uses a bolt action that is similar to modern bolt action firearms. Instead of a plunger, a striker hits the percussion cap and fires the gun.

Bolt Action

- **Break Action:** Similar to a modern break-action rifle or shotgun, a switch or lever drops the action down. This exposes the breech for loading powder, attaching a cap on the nipple, cocking the hammer, and firing the gun.
- **Pivot Action or Drop Action:** the action either pivots forward or drops when the action is released.

Break Action

Pivot Action

Safety Procedures for Loading and Firing Inline Muzzleloaders

Follow the four basic rules for safe handling of firearms (ACTT):

- **Assume** every gun is loaded.
- **Control** the muzzle—point guns in a safe direction.
- **Trigger** finger—keep your finger outside the trigger guard until ready to shoot.
- **Target**—be sure of your target and what lies beyond.

Due to the variety of modern inline muzzleloader actions and their continuing development, follow the instructions from the gun manufacturer to safely load, fire and unload them.

- NEVER use smokeless powder in a muzzleloader—unless the gun manufacturer specifies the barrel is capable of withstanding the pressure of smokeless powder.
- NEVER pour powder from a powder horn or flask directly into the barrel. Always use pre-measured powder and store it in small canisters in the possibles bag—away from the gun.
- NEVER start a bullet with a ramrod; always use the starter rod. Also, always push the bullet to the breech in short, strong strokes. NEVER try to force the bullet greater distances as the pressure may break the rod, resulting in serious injury to the hand. Fiberglass and metal ramrods offer greater protection from injury than wooden ones.

Always use the starter rod to start a bullet.

Always read and follow instructions from the manufacturer to understand how to safely load, fire and unload your firearm.

Traditional Percussion Muzzleloader

Frustrated with the relatively slow firing of the flintlock gun while duck hunting, Reverend Alexander Forsyth, a Scottish Presbyterian minister, invented the percussion cap in 1807. The percussion system uses a tiny copper or brass cup filled with a detonating compound that the shooter places on a nipple to fire the powder charge.

Percussion Rifle Ammunition

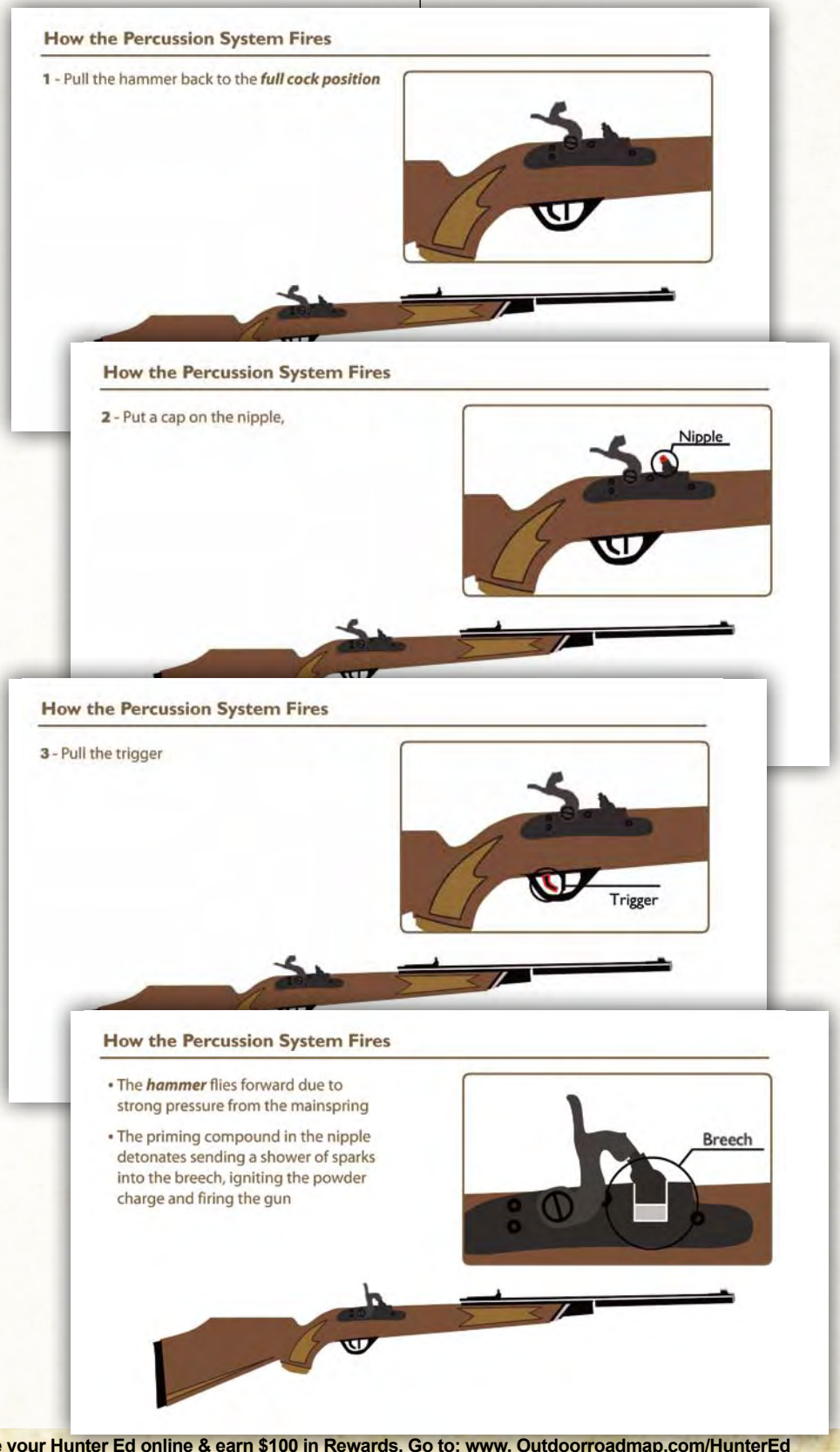
Percussion rifle ammunition includes the following parts:

- Round ball made of lead with patch or conical bullet made of lead with grooves for lubricant and szide to the fit the bore.
- Premeasured loose black powder or a black powder substitute stored in small, plastic canisters or a black powder substitute in premeasured pellets.
- Percussion cap.

How the Percussion System Fires

Pull the hammer back to the full cock position, put a cap on the nipple, and pull the trigger. The hammer flies forward due to strong pressure from the mainspring. The priming compound in the nipple detonates, sending a shower of sparks into the breech, igniting the powder charge and firing the gun.

In comparion to the flintlock system, the percussion system provides near instant firing of the gun.



Flintlock Muzzleloaders

In the early 1600s, Marin le Bourgeiys of France invented the flintlock firing mechanism. This gun was dependable, affordable for most people, and easy to maintain. By the mid-1600s, hunters in Europe and the Americas used the flintlock. In the 1700s to early 1800s, gunsmiths in Pennsylvania and Kentucky made some of the finest flintlocks.

Armies on all sides in the American Revolution and the War of 1812 relied on the flintlock.

Flintlock Ammunition

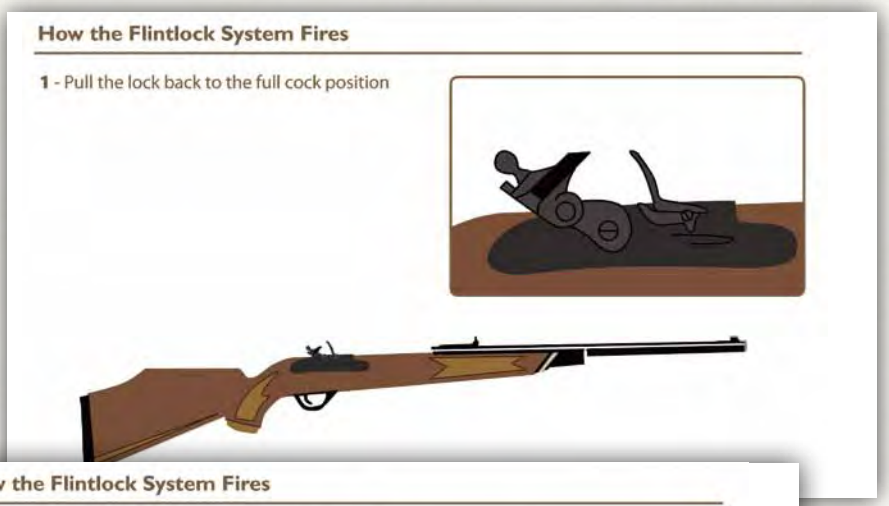
Ammunition for the flintlock system includes the following parts.

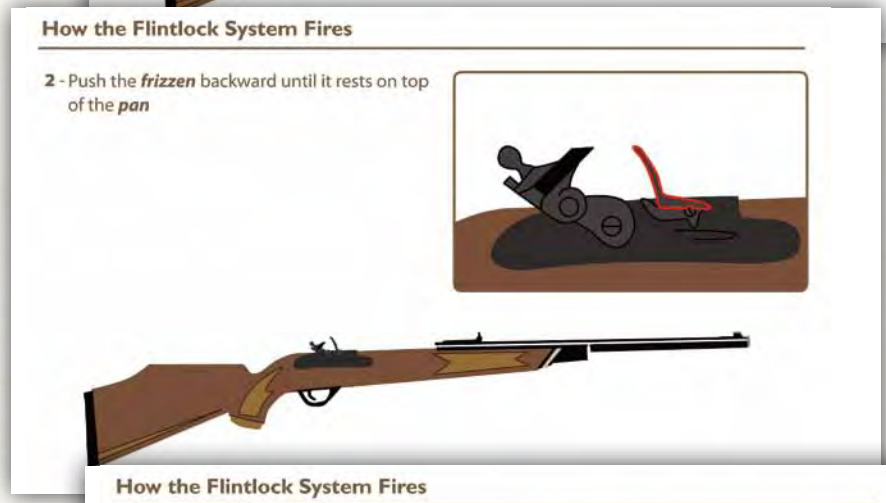
- Ball: round, made of lead, and sized for the bore; or conical bullets with a rifled barrel.
- Patch: round piece of cotton cloth or "ticking" sized for the ball and bore that provides a seal around the ball.
- Patch lube: the shooter's spit or a handmade lubricant made of one part beeswax and two parts mutton fat melted, mixed and cooled.
- Powder: black powder in grains classified as FFg (about the size of large grains of sand) for calibers .45 and larger or FFFg (about the size of small grains of sand or normal household salt grains) for calibers from .36 to .45.
- Priming powder: black powder in fine grains measured as FFFFg (about the size of very fine sand).

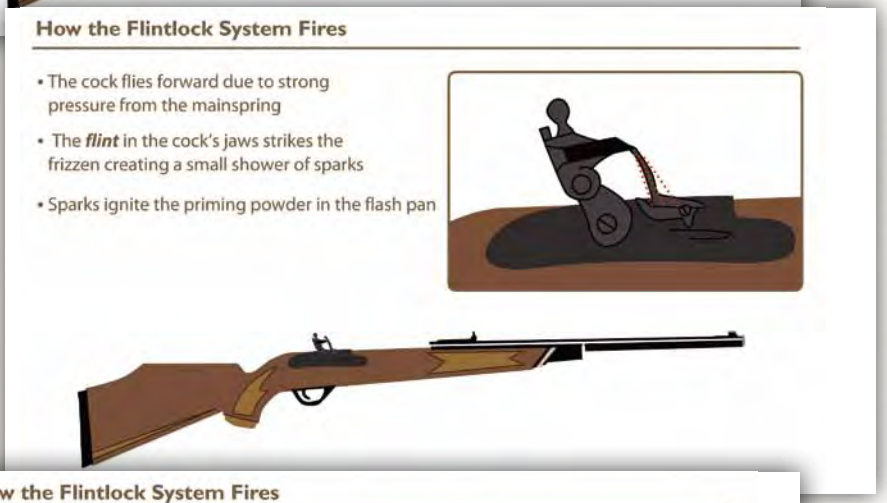
Flintlock Ammunition

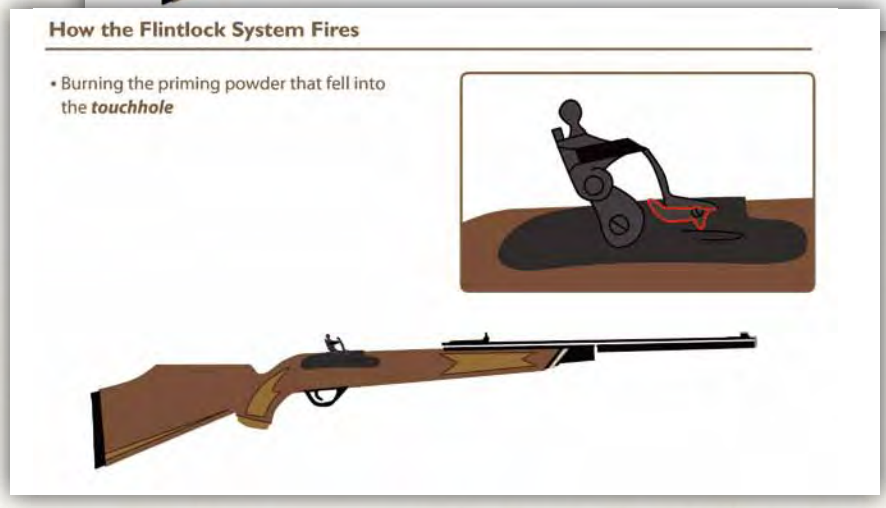
How the Flintlock System Fires

Pull the lock back to the full cock position, push the frizzen backward until it rests on top of the pan, and pull the trigger. The cock flies forward due to strong pressure from the mainspring. The flint in the cock's jaws strikes the frizzen creating a small shower of sparks. These sparks ignite the priming powder in the flash pan, which burns rapidly, including burning the priming powder that fell into the touchhole. When the priming powder burns through the touchhole, it ignites the gunpowder in the barrel, firing the gun.









If this seems like a long process, it is—by today's standards and in comparison with the percussion system. In its time, however, the flintlock was the best muzzleloader firing mechanism.

Lesson 2: Types of Black Powder and Black Powder Substitutes

Objective

In this lesson you will:

- Describe the varieties of black powder and black powder substitutes for use in muzzleloaders.

Black powder and black powder substitutes are the only powders or propellants to fire most muzzleloaders safely. Both burn quickly. They can ignite from sparks, heat, impact, static electricity and even sunlight. They also are sensitive to moisture and will not ignite when damp or wet. For these reasons, correctly storing and handling these powders is critical.

Federal government classifications:

- Black powder classified as an explosive
- Black powder substitutes are classified as smokeless powder

Black Powder

Black powder comes in four types. "Grain" is the term for measuring black powder. The finer the powder grain, the faster it will burn and create more pressure.

Types of Black Powder and Their Uses

Be sure to follow the manufacturer's recommendations for the type and amount of powder to use in the muzzleloader firearm.

Black powder is corrosive. It is important to clean the muzzleloader at the end of each day's use. Use soap and water or other cleaning products

Black Powder

TYPE	GRAIN	USE
Fg	Coarsest powder	For muskets with very large bores
FFg	Second Coarsest	For muzzleloader shotguns, rifles and pistols .45 caliber and larger
FFFg	Fine Powder	For .36- to .45-caliber muzzleloaders
FFFFg	Very Fine	For priming the flash pan of a flintlock

recommended by muzzleloader manufacturers to clean black powder residue from the gun's internal and external surfaces.

Black Powder Substitutes

Pyrodex is the most common substitute for black powder. Its burn rate is similar to black powder, but it is not so corrosive and does not leave a messy residue. It is available in loose grains and premeasured pellets.

Pyrodex

There is a variety of black powder substitutes currently available including: Triple Seven and Black Mag3. Each one comes in loose grains. Triple Seven also is available in pellets.

Black Powder Substitutes

Over time there may be more black powder substitutes.

Before using a black powder substitute to load the muzzleloader, read the instructions and cautions from the powder manufacturer and the gun manufacturer for safe applications.

Lesson 3: Safety Rules for Muzzleloader Hunting

Objective

In this lesson you will:

- Explain the safety rules for hunting with a muzzleloader.

Safety Procedures for Loading and Firing Muzzleloaders

Follow the four basic rules for safe handling of firearms (ACTT):

- Assume every gun is loaded.
- Control the muzzle—point guns in a safe direction.
- Trigger finger—keep your finger outside the trigger guard until ready to shoot.
- Target—be sure of your target and what lies beyond.

Restrict the Shooting Distance

In general, a muzzleloader rifle has a shorter effective range than a modern rifle firing a self-contained cartridge. When hunting with a muzzleloader, know its effective range.

The effective ranges listed below for hunting with a muzzleloader rifle apply to ordinary guns firing black powder or black powder substitutes.

- Muzzleloader flintlock or percussion smoothbores firing .45 caliber barrels or larger and using patched, lead round-ball with black powder have an effective range out to 50 yards.
- Muzzleloader flintlock or percussion rifles with .45 caliber barrels or larger and using patched, lead round-ball with

Muzzleloader Safety Precautions

- *Always wear eye protection when shooting flintlock and percussionmuzzleloaders.*
- *Unload or discharge muzzleloader firearms before placing them in storage.*
- *Clean muzzleloader firearms immediately after use.*
- *Maintain muzzleloader firearms in good operating condition.*
- *NEVER expose black powder to open flame.*
- *NEVER store black powder in steel, iron or other material that can spark.*
- *NEVER blow down the barrel of a muzzleloader.*
- *NEVER pour powder directly from the flask or horn into the barrel.*
- *NEVER use smokeless powder in a muzzleloader unless specifically designed for smokeless powder (see manufacturer's recommendations).*

black powder have an effective range out to 100 yards.

- Muzzleloader percussion rifles with .44 caliber barrels or larger and using the traditional percussion or inline percussion systems have an effective range out to 150 yards.
- Muzzleloader shotguns of at least 20 gauge, muskets of at least 45 caliber, ammunition restricted to patched lead round-ball only, ignition system restrictions for this class - none, sight restrictions for this class none, effective range 50-75 yards.

For precision muzzleloaders and muzzleloaders that use smokeless powder, the hunter should consult the operator's manual to determine effective range.

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