# National 4-H Shooting Sports
# Quiz Bowl
# Shotgun Study Resources

**These resources are for enrolled 4-H shooting sports members and coaches for their expressed use as study materials in preparation for the National 4-H Shooting Sports Quiz Bowl. They are not to be used to train a person or persons in the use, discharge, or handling of any firearms and archery equipment.**

# Lesson 1 Narrative – Safe Shotgun Handling

Shooting safety does not just happen. It is the responsibility of every person on the range - the range officer, coaches and instructors, shooters and spectators. Ultimately the shooter is responsible for his or her actions, his or her personal safety and the safety of every other person around. The objective of this session is to instill the fundamentals of safe firearms handling and range behavior. We will use a combination of methods, including hands-on practice, to accomplish this.

A shotgun is a tool, like a power saw or a lawnmower. When used properly, a shotgun can hit moving targets the way it was designed to do. But when improperly used, it can kill or injure the shooter or anyone nearby. A shotgun poses no danger if the shooter exercises responsibility and common sense. Shooting safety demands constant attention, understanding and personal responsibility.

Even behavior off the firing line influences those who are on the line at the time. This time also gives the shooter a chance to observe and learn from watching other shooters, as well as listen to advice of coaches and rehearse the behaviors needed for solid shotgun shooting. Participants not on the firing line are expected to act in a responsible manner. Disruptive behavior cannot and will not be tolerated. Not only does it make learning difficult for those on the line, but it also creates a potential hazard for all persons on the range. The instructor or range officer is the ultimate authority on the range, and that includes the spectator or observation area. Show respect for the other shooters and obey all instructions or commands from range officials.

## Shotgun Handling Safety

To handle a shotgun, or any firearm safely, the shooter must be completely-100 percent sure of their gun's status always. Firearms do not think. The shooter has mental control over it.

To handle a shotgun safely, shooters must know how the parts of the gun operate. They must understand the necessity for muzzle control. They must be able to determine a shotgun's status and know how to make it safe. They must know how to load or unload it safely, how to fire it and operate the action. These simple things must be learned and practiced.

Both mental and physical skills must be developed by safe and responsib1e shooters. Self-control is one of the most important elements of safety. It may seem to be an attitude, but it is a learned skill. Muzzle control is similar. It involves both a conscious awareness and an attitude of responsibility, as well as the physical skills to handle the shotgun with control and muzzle awareness. Muzzle control makes the difference when a handling mistake or a malfunction causes a shotgun to discharge unexpectedly. The result is determined entirely by the muzzle control of the shooter. The other mechanics of shotgun handling must become instilled, so the shooter can perform them while consciously focusing on safety.

Developing safety conscious habits of shotgun handling takes effort and reinforcement. It is a matter of attitude. You must consider safe gun handling so important that no one ever needs to worry about your shotgun. Safety is your job; never permit a potential accident to occur. Exercise complete control over your shotgun at all times. Knowing the rules is not enough. They must be practiced constantly without lapses. Even when safety becomes second nature, shooters must make a conscious effort to keep their shooting safe.

## Basic Rules for Safe Gun Handling

Shooting organizations promote a set of rules for safe firearms handling often called, 'The 10 Commandments of Shooting Safety'. In their most basic form, they include self-control, muzzle control, personal assurance of a "safe" firearm and trigger control. All the others are based on these basic rules.

**Always keep the muzzle pointed in a safe direction.** Whether shooting, hunting or just handling a firearm, the muzzle must always be kept under control. It should *never* be pointed at another human being, nor at anything you are not willing to shoot, destroy or kill. Your location and common sense will tell you which direction is safest under various conditions. It is usually safest to point the muzzle of a shotgun down range (into a safe shot-fa1l zone) or straight up.

**Keep the shotgun empty with the action open and exposed to view except when preparing to shoot**. Any firearm with its action closed should be considered loaded and ready to fire. The first act after picking up a firearm is to point the firearm in a safe direction then open the action and verify personally that the gun is unloaded in both the chamber(s) and the magazine. Be sure beyond all shadow of doubt. In order to keep the shooting range safe, all shotguns are to have their actions open and exposed to view at all times except while actually firing. Except in the ball and dummy instruction activities, guns with closed actions should never be passed between people. Practice opening the action before passing any firearm to another person and insist that others do the same. Your life and that of other people is at stake.

**Keep your finger off the trigger until you are in the act of shooting**. It is very tempting to place your finger on the trigger when handling a gun. This bad habit can be prevented by consciously avoiding it when you start handling firearms. The trigger guard is there to protect the trigger and to help prevent accidental discharges. The finger should be placed along the side of the trigger guard to reinforce this function. Placing your finger on the trigger of a firearm means the firing sequence has started. A sudden bump or startling noise could cause you to move discharging that shotgun without intending to do so. Be safe; stay clear of the trigger until you are ready to fire.

**Treat every firearm as if it were loaded. This applies even to those you have personally checked to be sure they are unloaded.**

The golden rule of firearm safety is to **treat every firearm as if it were loaded. This applies even to those you have personally checked to be sure they are unloaded.** Shooting safety means that you must pay attention to detail and show the responsibility needed with loaded firearms always. By handling unloaded guns with the same respect as a loaded one, you will establish good gun handling habits and will never have to say, "I thought the gun was unloaded." If other shooters refuse to follow these guidelines, refuse to associate with them in any firearms handling situation. They are unsafe and pose a danger to both themselves and to you.

## Shotgun Handling Procedures

Many circumstances require a firearm to be passed between two individuals. The teaching method we will use requires passing loaded shotguns from a coach or instructor to a shooter. We will use a standard process to pick up a shotgun or pass it between people on the range.

You may have noticed that all the shotguns used here have had their actions open with the muzzles pointing away from people. We will keep all shotguns stored in this condition on a rack, bench, table or other surface until they are ready to be used. Before picking up a shotgun, check to see that it is empty. Grasp it firmly by the forearm with one hand and by the grip with the other. This requires the use of both hands. With a firm and secure grip, lift the shotgun. Never grab a gun by the barrel to drag it toward you or swing it into your grasp. That provides poor muzzle control and exposes you and others to potential danger. It also risks dropping and damaging the shotgun. Sliding the gun across a surface also should be avoided. Such actions can scratch or mar both wood and metal surfaces, as well as risk exposure to danger (and the wrath of the shotgun's owner.)

Passing a shotgun between people always requires caution. Since the teaching method involves handing a shotgun with a closed action to another person, an extra measure of caution is necessary. The instructor or coach must maintain control of the shotgun and the muzzle direction until the shooter signals that they have the gun and its direction under control. Here is how to do this effectively. The instructor loads the firearm and closes the action with the shotgun pointed in a safe direction. Before handing it to the shooter, the instructor grasps it with one hand on the forearm and the other on the action. The hand grasping the action should have its fingers extended over the trigger guard to prevent the shooter from touching the trigger. The shooter should grasp the shotgun firmly with one hand on the forearm and the other on the grip. Once their grasp is secure, the shooter should say "thank you" to indicate that the gun is under control. The instructor should say "you're welcome" to indicate that he or she is releasing the shotgun. Safe handling is introduced while reinforcing courtesy and sportsmanship.

## Elements of Safe Shooting

On the range or in the field, safe shooting demands certain things of the shooter. Some are skills. Others are matters of knowledge and preparation. The skills will develop with practice, but they must be practiced until they become fixed. Some of the knowledge must be memorized. Some of it is a matter of common sense.

**Know how your gun operates**. This may seem elementary, but the shooter must learn how the gun works, what it can do and what its limitations are. Opening and closing the action, operating the safety and coping with minor malfunctions are also essential knowledge. Safe and proper shooting technique comes with practice.

**Be sure your gun and ammunition are compatible**. Shotgun shells are not interchangeable between gauges or even between lengths in some cases. Only shot shells that are manufactured for your shotgun should be carried. Using the wrong shells or mixing gauges can have disastrous results. Note that a 3-inch shell fits easily in a $2^{3}/_{4}$-inch chamber. A fired 3-inch case dropped into the same chamber tends to project slightly. It can be forced into the barrel, but it does not fit easily. Why does that happen? When the shell is fired, the crimp begins to unfold. Since the chamber is too short, it unfolds into the barrel, causing it to be partially obstructed. This results in increased pressure levels and stresses on the barrel. In an extreme case, the barrel could rupture, causing injury. Be sure the shells are appropriate for the gun being used.

**Carry only one gauge of ammunition when hunting or shooting.** Watch what happens when a 20-gauge shell is dropped into a 12-gauge barrel. Note that a 12-gauge shell can now be chambered behind it. What could happen if this shell were fired? Not only is the barrel obstructed, it also contains an additional round that will fire when struck. The barrel is likely to burst, destroying the barrel or the shotgun and risking injury to the shooter and others. This is not the only potentially dangerous combination. The same thing can happen with 16-gauge shells in a 10-gauge or with 28-gauge shells in a 20-gauge. *Do NOT mix gauges!* Let your buddies carry their own shells.

**Do NOT mix gauges!**

**Be sure of your target and what is beyond.** Every shooter must be sure they correctly and completely identify their target *before* firing a shot. They also must make sure that the area beyond the target provides a safe shot-fall zone for their load. A shooter must never fire in a direction where any potential for a mishap is present. Remember, the range of a shot charge is proportional to the size of the shot. Although target loads normally have a range of less than 300 meters (330 yards), buckshot may have a range of more than twice that distance. The shooter relinquishes all control over the shot as soon as it is fired, so the determination of a safe zone of fire must be made before the trigger is pulled.

**Wear eye and ear protection when it is appropriate**. Eye and ear protection should be considered mandatory for all shooters, coaches and others on the range. Vision is priceless, so it would be

wise for everyone to protect their eyes. The likelihood of an injury is relatively small, but the impact of such an injury could be serious. Stray or deflected pellets, target chips, gases and powder residue from shotgun and other foreign objects have the potential to damage the eyes. The simple precaution of wearing shooting glasses protects them. Many shooters combine their eye protection with corrective lenses or tinted lenses that increase contrast, reduce light intensity, or enhance vision in other ways. Eye protection should be used whenever shooting is taking place.

Like sight, hearing is a precious gift. The sound levels produced by any powder firearm are sufficient to cause hearing damage. Hearing damage is usually gradual. The shooter seldom notices the loss until it is serious. The damage is cumulative and permanent. The infrequent firing during hunting may have little effect, but some shooters wear ear protection even while hunting. All authorities agree, however, that the damage from the prolonged exposure during target shooting is a real and present threat. Shooting without hearing protection does not show toughness. It shows foolishness. Inexpensive and comfortable hearing protection in the form of either plugs or muffs is readily available. Some shooters use both plugs and muffs for added protection. Instructors often use electronic muffs to allow them to hear better for firing line control. The sounds of firing are muffled electronically. Choose the type of protection that fits your shooting style and budget. Always wear them on the range. Your inner ears will repay you with better hearing.

**Avoid mixing alcohol or other drugs with shooting.** Anything that reduces your concentration or judgment while shooting poses a threat to you and others on the range. Alcohol and other depressant drugs cloud judgment and reduce concentration even though the user experiences a heightened sense of security or ability. Illegal drugs are not the only culprits. Some prescription or over-the-counter medicines may have the same effect. Cold tablets, cough suppressants, antihistamines and some pain relievers can have a similar effect on some people. Read the label and observe the impact the drug has on you before entering the shooting range. Products that cause drowsiness or similar effects should not be used if you are shooting. If you are using them, you should not be shooting.

**Be aware of special precautions related to the specific situation.** Special circumstances or unique features of a particular site may require additional safety rules. If you are not sure a situation is safe, *ask your range officer!* The range officer is responsible for controlling the range, assuring that all safety rules are followed and ensuring that all shooters are treated with respect.

## Personal Responsibility and Safety

Occasionally you may encounter unsafe shooters; even experienced shooters become lax at times. Do not allow people who are acting foolish and practicing risky behavior to influence you. Point out the unsafe behavior. If the shooters refuse to modify their behavior to meet the standards of safe shooting, don't shoot with them. As you grow older, you will become increasingly concerned with shooting safety. Shooting is a very safe sport, safer than such non-contact sports as tennis; but the results of a shooting accident can be disastrous. Keep shooting safe by insisting on the highest standards of safety from yourself and everyone who shoots with you.

## Summary

Are there any questions? Be sure to review this material before our next meeting. If you don't understand something in your review, write yourself a note and bring it to the next session. Today we learned about safe gun handling practices. We learned that we must check all guns to see if they are loaded before handling them. You have demonstrated your ability to safely handle shotguns. In our next session we will move to the range and begin learning to hit moving targets with a shotgun.

## Summary Activities

1. With a teen leader or assistant instructor in charge of each small group, have every shooter go through the mechanics of using the shotguns that will be used in the shooting sessions. Have them check and clear the shotgun. Then let them load, unload and operate the safety. Use a mousetrap pistol to demonstrate trigger operation. *Instructor note:* No live ammunition should be present. Use only dummy rounds or snap caps.

**No live ammunition should be present. Use only dummy rounds or snap caps.**

2. Have teen leaders or assistant instructors work with small groups practicing the procedures for picking up a shotgun, checking it for safety and passing it to another person.
3. Have teen leaders or assistant instructors conduct an informal quiz over the content of this lesson and the previous one.
4. Role play several range or field situations and have the participants discuss safe muzzle directions and other safety considerations.

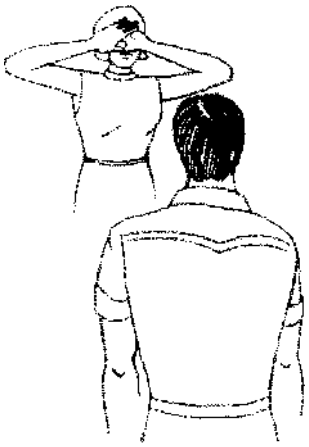
## Exhibit and Sharing Ideas

1. List some of the things you learned in your shooting journal.
2. Make a poster or a set of signs reinforcing the cardinal rules of safe firearms handling. Post them in the classroom, the shooting range or at the county fair

3. Make a poster or display that illustrates one of the safety considerations in shotgun shooting (for example, show the range of various shot sizes). Integrate the posters into a display for 4-H Week, your club, National Hunting and Fishing Day or some other timely event.
4. Prepare a group exhibit or demonstration on shotgun safety.
5. Prepare a demonstration or illustrated talk on shotgun safety and share it with your club, other interested shooters or a small group of adults.
6. Demonstrate and practice the protocols for passing a shotgun between two people with a parent or other interested adult.
7. Explain the basics of shotgun safety to a parent or other interested adult

# Lesson 2 Narrative - Shotgun Shooting Fundamentals

Shotgun shooting involves hitting moving targets with a cloud of moving shot. To accomplish this, the shooter must see the target, point the shotgun and fire when all the moving parts are in a proper relationship to each other. Learned skills and coordination are needed for effective shooting. One element must be determined before learning can begin. The shooter must know which eye is dominant when the shotgun is pointed.



## Eye Dominance

Most people are right handed. The clear majority of them are also right eyed. Others have a dominant left side. Some people are cross-dominant, with their handedness and eyedness on opposite sides. Shooting is more easily learned if the shooter allows the dominant eye to serve its natural function. Right-eyed people should shoot from the right shoulder and left-eyed people should shoot from the left shoulder regardless of their hand dominance.

Finding out which eye is dominant is easy. Stand about 3 meters (10 feet) from your partner, facing each other squarely. One of you should place one thumb on top of the other and cross the fingers of the top hand over the fingers of the bottom one, leaving a small triangular hole. With both eyes open, face the other person squarely and raise your hands until you can see your partner's nose through the hole. Hold your position for a few seconds, while your partner notes which eye they can see. Then bring your hands back to your face slowly while keeping your partner's nose in focus and in the middle of the hole. Partners, watch for any switching of the hands from eye to eye, and be sure the hands return to the eye you saw through the opening earlier. The eye your hands come to is your dominant eye. Try it again. Now change roles and do the whole thing again.

How many of you are left eyed? Even if you are right handed, you should learn to shoot left handed. It is easier to teach your non-dominant hand what to do than to switch your eye dominance. Since pointing is one of the key elements in hitting a target with a shotgun, the dominant eye needs to be involved or a lot of unexplained missing will take place. Demonstrate that for yourself. With both eyes open, point at a distant object with your finger. Cover your non-dominant eye with your other hand. Did your finger stay on the object? It should have. Now, cover your dominant eye. Did your finger seem to jump to the side, pointing to the wrong spot? That is exactly what happens when you try to shoot with your non-dominant eye. The dominant eye takes over and you wind up pointing at the wrong spot.

Some shooters compensate for being cross-dominant by shooting with the dominant eye closed. Although that works, it is a much poorer shooting strategy. You lose depth perception and peripheral vision.

Both are helpful to a shotgun shooter. Be patient and try to use the dominant eye. You will shoot better if you do.

(Refer to Fact Sheet #3)

## Shotgun Shooting Fundamentals

**Please note that all the instructions are given in relation to the dominant eye. Thus, "dominant" or "shooting" side is on the dominant-eye side. Similarly, "non-dominant" or "off" side revers to the opposite side.**

Shotgun shooting is learned, not an inborn gift. Six fundamental form concepts must be learned and practiced before they can be put together effectively: stance, gun-ready position, mounting the gun, swing to the target, trigger pull and follow through. Each of them involves a number of skills important to good shotgun shooting. We will develop them one at a time before trying to put all of them together. *Please note that all the instructions are given in relation* to *the dominant eye. Thus, "dominant"* or *shooting" side is on the dominant-eye side. Similarly, "non-dominant" or "off" side refers to the opposite side.* These instructions are the same for both right- and left-handed shooters.

Stance

(Refer to Fact Sheet #4)

The stance is the position and posture of the body during shooting. It is the foundation of good shooting. Although some variation in stance is seen among good shotgun shooters, most of them share certain elements. Freedom of movement is vital. The stance provides support and recoil absorption; the shooter is oriented to the area where the target will be broken.

**S.T.E.M. Connections**

***Know Them Bones***

A proper shotgun shooting stance starts with the feet. One experienced shotgun instructor says, "You may hit the target with the shot, but you miss with your feet." The body should face the area where the target is likely to be broken. The feet should be comfortably set about shoulder width apart. The off foot should be slightly forward of the dominant foot, perhaps 10 to 20 centimeters (about 4 to 8 inches). The weight should be evenly distributed, favoring the forward foot slightly. When the feet are properly set, a line drawn through the heel of the rear foot and toes of the front one should point to the area where the target will be broken.

The knees should be bent slightly, giving the hips freedom to rotate freely. This movement is critical when shooting crossing targets, since a smooth swing starts from the hips rather than the upper body. Most instructors refer to this as a boxer's stance. It shows the same readiness to act and freedom of movement a boxer must have.

The upper body also requires a boxer's stance. The off hand, the one that will hold the forearm or forend on the shotgun, is extended halfway or slightly more. The arm is held nearly parallel with the ground, giving the upper body freedom to move. The dominant hand, the one on the grip and trigger, is held closer to the chest. Most good shooters also raise that elbow to aid in movement.

This stance is the one that will be assumed as the shooter prepares to call for a target with the gun either in the ready position or raised and ready to fire.

Gun-Ready Position

We will be shooting from a high-gun position during the early part of the instruction. A proper **gun-ready position** is essential for hunting, sporting clays, international skeet and other shotgun shooting activities. We will teach the position as part of the fundamentals and practice it in a controlled way each time the shotgun is fired.

Gun-ready position is the upper body posture and the position of the shotgun prior to mounting the gun. The shotgun is angled slightly across the chest. The muzzle should be on or slightly below the flight line of the target. The heel of the stock should be under the dominant elbow and slightly above the belt or waist. The toe of the butt plate or recoil pad should be on or near the point of the hip. The stock should be held close to the body, barely touching it or within a few centimeters (about $1^1/_2$ inches). The elbow of the shooting hand should be lifted about 5 to 10 centimeters (2 to 4 inches) away from the stock. This position makes raising the gun to the shoulder easy by keeping the butt of the gun forward of the arm pit and free from any restrictive contact with the clothes.

The off elbow should be flexed, placing the hand on the forearm without extending the arm fully. The shotgun should be balanced between the hands. If the stock is the proper length, the forward hand should be near the middle of the forearm. Some shooters prefer to move their hands back toward the receiver for better support and control and many good shooters point the index finger toward the muzzle, and at the target with it. Both hands should grip the shotgun firmly, but without excess tension.

Both your eyes should be open and looking at the area where the target is expected to appear. If the muzzle obstructs your vision, lower it slightly. Good shooting demands that you be able to see the target quickly and clearly. Once the target appears, every bit of concentration should be focused on it. Both the background and the barrel will be somewhat out of focus, but the target will be in sharp focus.

Mounting the Shotgun

Refer to Gun Fit Fact Sheet

Bringing the shotgun into shooting position on the shoulder is called mounting the gun. The shotgun is raised to the face and shoulder in a smooth motion. The muzzle acts as a pivot point for the mount with little vertical movement. It should track the target (begin moving along the flight path of the target) as the stock comes to the cheek. The head remains comfortably erect as the stock is brought up to the dominant cheek. This mounting method prevents many of the problems associated with head position that bother shotgun shooters. Avoid bringing the gun to the shoulder and lowering the head to the stock. With practice, the stock will reach a consistent position on both the shoulder and the cheek. This will lead to quicker and better shooting. The cheek and the comb should remain firmly against each other throughout the firing process. The butt of the stock should be held firmly against the shoulder in the pocket formed when the dominant elbow is raised to shoulder height. The heel of the stock should not

project much above the top of the shoulder. That keeps most of the butt against the shoulder and helps to distribute recoil.

During the mount, the upper body should move forward slightly, leaning 70 to 80 percent of the weight on the front foot. The forward knee should flex slightly as well. This brings your head into a position almost directly over the forward foot. We will take our time with this process, mounting the gun before calling for the target. With practice the mount will become a swift and fluid motion that blends with the swing to the target and follow through.

Swing to the Target

As you gain experience and begin shooting from the gun-ready position, the mount and swing will blend into a smooth motion. Since we are starting with the gun mounted, the swing will be taught as a separate unit first. With the gun at the shoulder and your gaze shifted to the area where the target will appear, call for the target by saying "pull." As soon as you see the target, focus all your attention on it and point the shotgun at it by swinging the entire upper body and shotgun as a unit. When shooting at rising, straight-away targets, simply point the gun at the clay target and shoot. When other angles are encountered, you must swing the shotgun to and through the target smoothly. The legs and hips power the swing and the upper body and shotgun move as a unit. Some lead will be needed to hit a crossing target. Every shooter perceives an appropriate lead differently. A swing-through method of leading will usually succeed for most shooters. Starting with the shotgun behind the target, accelerate the muzzle through the target along its flight path. As the muzzle clears the target, point ahead of the target, fire and continue to swing. Target shooters often prefer a sustained lead where the muzzle is perceived as towing the target with a gap of appropriate length. Both methods require practice, and both depend upon the shooter to perceive the relationship between the muzzle and the target, pointing rather than aiming.

Trigger Pull

Successful shotgun shooting requires proper timing of a shot charge and a target. You must fire the shotgun when the muzzle is pointing at the location where the target will be when the shot charge arrives. Since the shot charge is spread over a fairly large area, there is no need for the careful aiming needed with rifle shooting. In fact, that approach is likely to cause all kinds of difficulties for the shooter. The trigger needs to be pressed with a quick, crisp pull, but not snatched or jerked. Violent movements can disrupt the smooth swing essential to good shotgun shooting. The shotgun should flow smoothly from the mount to the follow through without interruption by the trigger pull. Eventually, a conditioned reflex of hand-eye coordination will fire the shot when the target and muzzle are in the proper positions.

Follow Through

Follow through refers to the continued smooth swing of the shotgun after it is fired. Many instructors consider it the most important part of consistent shotgun shooting. Follow through the recoil of the fired shot until after the target is broken. To practice a follow through, many shooters follow a broken piece of the target to the ground. Follow through becomes more important as the speed of the target increases. As with other elements of the swing, good follow through is governed by movement of the hips and legs.

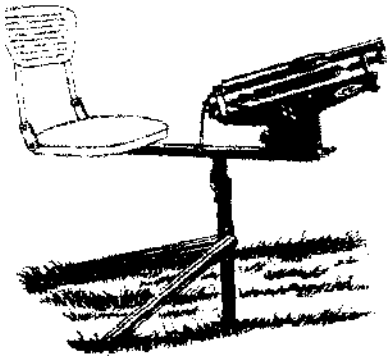
**S.T.E.M. Connections**

***A Catapult Fling***

Putting all these elements together into a swift and smooth action may seem like a challenge. It is, but it is a challenge you can meet. We will put each of these skills together to help you hit targets effectively and add new challenges when you are ready. Let's move over to the firing line and get started on your skills.

## Orientation to Clay Targets

A standard clay target looks somewhat like a frisbee or a saucer. Other shooting games like sporting clays can use other types and sizes of targets, but we will use the standard trap and skeet target for instructions. These targets may be painted, unpainted or painted only on the dome. Usually they are painted white, yellow or orange for better visibility.



Watch while this target is thrown. I will call for the target as you will during instruction. “Pull." What did you notice about the target's flight? The target flew in a curved course, rising to a peak height, and then falling to the ground about 50 meters (55 yards) away. The target had a straight line of flight. The target was spinning as it flew. Let's watch a few more. Did you notice anything else about these targets? They landed close together, so they had a consistent line of flight. Wind gusts can cause them to rise, fall or curve to one side. They also slow down as they move down range.

## Orientation to the Trap

These traps are powered by a strong coil spring that can be adjusted to throw faster or slower targets. Tightening the spring increases target speed. The throwing arm is cocked by grasping its upper edge with the fingers of both hands and pulling it back until it latches in place. Be careful when cocking the thrower arm or placing a target on it. It can deliver a very powerful blow if released.

**Be careful when cocking the thrower arm or placing a target on it. It can deliver a very powerful blow if released.**

To place a target on the thrower arm, grasp the target by its dome with the finger tips and set the target on the thrower arm against the back rail. Note that the thrower arm has a line marked on it. Place the target on the arm touching that line. That is what controls the direction of the target.

To launch a target, pull the **lanyard**. That releases the latch, allowing the spring to pull the thrower arm around powerfully.

*Never* release the thrower arm when anything is in its path. It could cause severe injury. Always leave the thrower arm un-cocked when the trap is not being used or is unattended. Let's spread out along the firing line and try throwing a target or two.

(Refer to Fact Sheet #14 & Range Set-Up Diagram)

## Orientation to Range Operation

*Instructor note:* This discussion is based upon a range set up in a safe, open area. If you are using a regulation field, you will need to modify your orientation to meet the local conditions.

Before we go any further, we need to understand how the firing line operates. The traps are lined up on the firing line. The danger area includes not only the area covered by the targets, but the shot fall zone as well. That zone extends 300 meters (330 yards) down range from the firing line. Firing should never take place with anyone in that area.

We will be retrieving some of the targets we use, but no one should be forward of the firing line until or unless specifically authorized by the range officer or instructor. Only after all the traps are sprung and the shotguns are safely in the racks will we move down range.

Notice that there is a carpet square on the ground to the left of each trap. The shooter will stand on that carpet square. The coach stands between the shooter and the trap operator, keeping clear of the throwing arm and making sure the shotgun never endangers the trap operator. The coach or instructor will keep all ammunition under control, either loading the shotgun for the shooter or handing the shooter a round to load personally. Although each firing point will operate independently during the ball and dummy exercise, the range officer or chief instructor is in ultimate control of the entire range. No shooter may touch a shotgun until the range officer declares the range open to shooting by stating, "Live ammunition on the range" or "The range is hot!"

The safety area behind the tape barrier is for spectators and shooters who are not on the line at the moment. Those in the safety zone must be careful not to disturb the shooters on the line or interfere with the instruction in any way. Disturbance behind the line is extremely dangerous to those on the firing line. Inexperienced shooters may have a lapse in muzzle control if they become distracted or embarrassed by actions behind them. Show respect and restraint when off the firing line.

Anyone on the range may declare a cease fire by shouting "cease fire!" or "freeze!" when an unsafe condition exists. That command stops everything on the range immediately. All shotguns should be kept pointed in a safe direction, coaches and shooters should wait for instruction from the range officer, and all trap operators should make sure no targets are thrown. Once the problem is fixed, the range officer will declare the range open and shooting may resume.

Do not fire another round without checking the barrel for obstructions.

Should a miss fire or other malfunction occur, keep the shotgun pointed down range for at least 30 seconds. Do not move the shotgun until an instructor or range officer takes control of it. If any shell fails to perform properly (bloopers or squib loads), *do not fire another round without checking the barrel for obstructions.* If in doubt, raise a hand to get help from the range officer or assistants.

## Summary

We have learned a great deal about shotgun shooting and ourselves today. You determined your eye dominance. You learned the fundamentals of shotgun shooting without equipment and with unloaded guns, practicing the six fundamentals of shotgun shooting: stance, gun-ready position, mount, swing to the target, trigger pull and follow through. Then we moved to the range and you got a chance to throw a few clay targets on the trap, to watch some targets in flight and to become familiar with range operation. Next time we will start on the range. If you have any questions between now and the next session, please write them on a piece of paper and bring them to the next session.

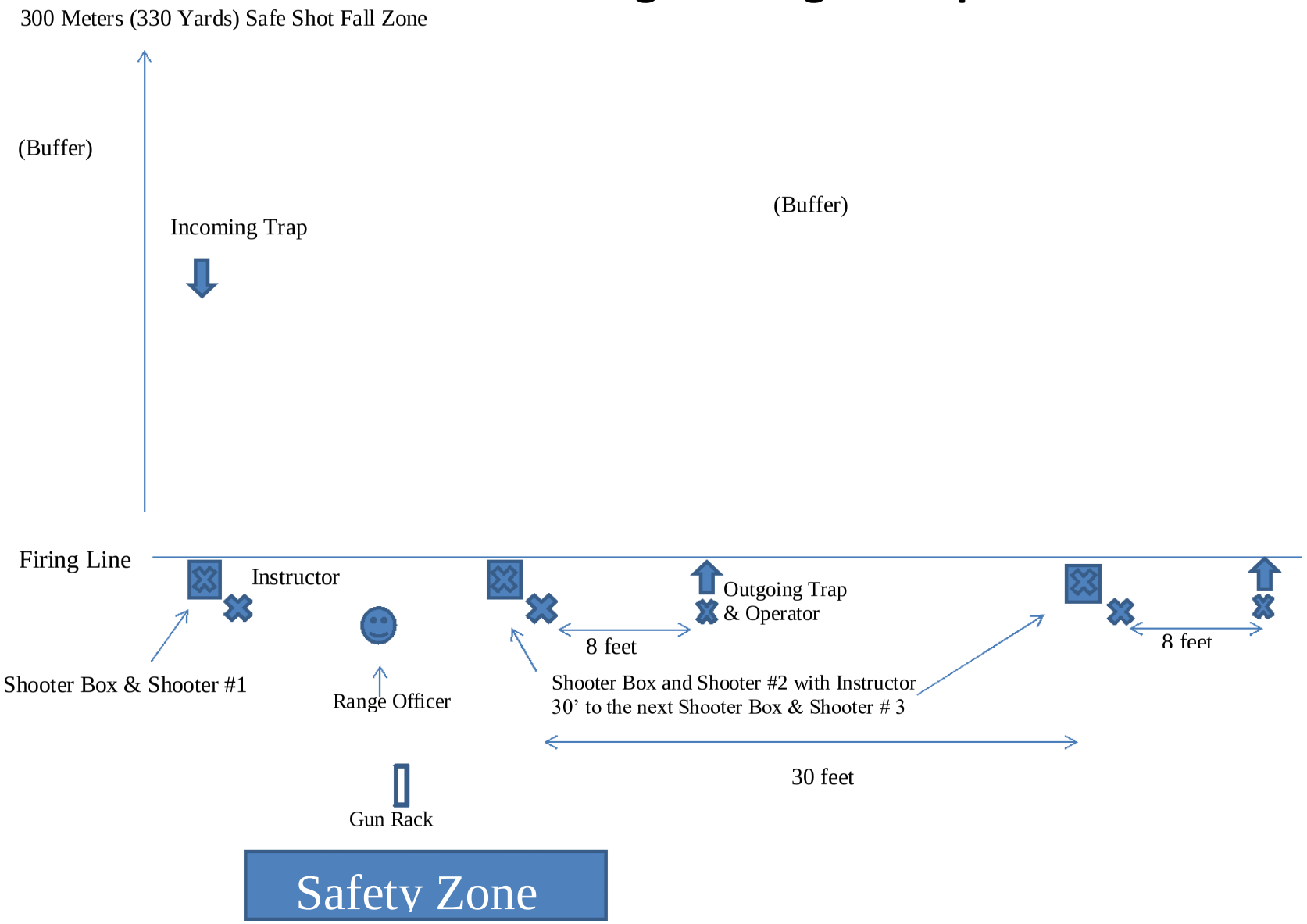
## Summary Activities

1. Have a teen leader demonstrate proper shooting form without equipment, then with an empty shotgun and then with several live rounds. Review the elements of shooting form with the shooters after each sequence, and any that are necessary later.
2. Discuss the content of the lesson with the shooters, ask them questions or responding to questions they may have.
3. Have shooters practice the elements of shotgun shooting form without equipment in the classroom and with dowels or empty shotguns on the firing line.
4. Demonstrate the potential for problems caused by disturbance in the safety zone using instructors and teens as models. Use only dowels or mimetics without equipment for the demonstration.

## Exhibit or Sharing Ideas

1. List the things you have learned about shotgun shooting and range operation in your shooting journal.
2. Share things you learned with a parent or other interested adult.
3. Construct a teaching poster listing the six fundamentals of shotgun shooting, how to determine eye dominance or range layout. Post it where it will remind your group of the right way

# Shotgun Range Setup



# Lesson 3 Narrative – Firing the First Shot

## Shotgun Shooting Fundamentals

We covered six fundamentals for shotgun shooting when we met last time. You had a chance to practice a stance, go to a gun-ready position, mount the gun, swing to a "target" and follow through without having a trigger to pull. You have learned how shotguns operate and the importance of safety rules when using shotguns. You are ready to begin developing shooting skills needed for becoming a successful shotgun shooter. We will take this process step-by-step, moving slowly and carefully toward becoming an accomplished shot.

Learning to hit a moving target involves a number of steps. The best way to learn is to be patient and take each step as it comes, even if it seems silly. We will not let you shoot your first shot before you are ready. Each of the steps we take is designed to prepare you for breaking your first target.

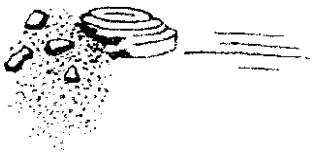
## Range Safety and Orientation

We discussed the shooting range last time. Anything down range of the firing line to the boundary of the shot-fall zone is a danger area. Shooters will be restricted to each of the shooting boxes marked by the carpet squares. No one is to approach the firing line until told to do so by the range officer (or chief instructor). All shooters who are not immediately involved in the shooting session must stay behind the safety line. The shotguns are in the rack between the firing line and the safety line. They have all been made safe before being put in the rack. Only the instructor for each firing point may pick up a shotgun. No one may have any live ammunition in their possession under any circumstance except for the instructors. When live ammunition is on the line and the line is ready for instruction, the range officer will announce it by saying, 'There is live ammo on the line." Anyone who sees an unsafe condition should shout "CEASE FIRE!" Any cease fire command must be obeyed immediately. If you are in the act of firing, stop if you possibly can. Stop where you are, open the action and remove the ammunition from the shotgun. Do not do anything else until the instructor corrects the problem and tells you to resume. These rules, and those we shared last time, are for your safety and mine. Anyone who does not follow them will be removed from the firing line.

## Targets and Traps

We have already observed several targets and practiced using the traps. Please pick up a clay target. Notice that it is very hard, made of clay and pitch and molded into a flying saucer shape. The targets are brittle, so they break easily when struck by shotgun pellets. Hit the target sharply in the center with your knuckles. Notice

that it shatters easily from the blow. The ease with which the targets break makes them as excellent indicator of hits by shotgun pellets. A visible chip from the target scores it as a hit. Millions of these targets are shot every year in practice and competition by shotgunners. Clay targets break down easily, but the pitch used in making them is toxic to swine. Do not use them where hogs could eat the chips. Remember that the traps are powerful and demand respect. When you operate the trap, take care in placing the target on the thrower arm so the targets will fly consistently.



## Shotgun Shooting Step-by-Step

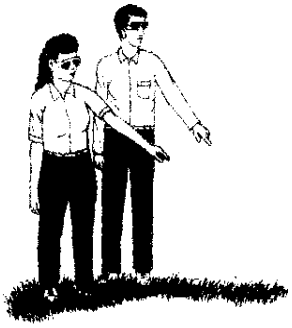
(Refer to debrief on Firing the First Shot)

Watching Targets

Let's all move to the firing line and review the flight of the target. Line up with about half the group on either side of the trap. Face squarely down range and watch as we throw several targets. As we learned last time, the shooters call for the release of the target by saying "pull."

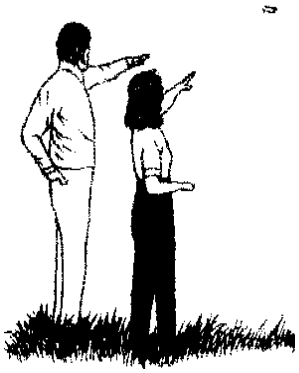
"Pull." Note the speed of the target as it is thrown. "Pull." Notice that the target travels in a straight line. "Pull." Look at how the target rises to a peak and then travels downward. "Pull." Remember that the location on the thrower arm is important for getting the target to fly straight down range from the trap.

Finger Point



Assume a boxer's stance with the off foot slightly forward and facing the flight path of the targets. Extend the off arm and point the index finger while holding the arm at about a 45-degree angle to the ground. When the target appears, raise your hand quickly and smoothly to point at the target and follow it to the ground. Keep both eyes open and concentrate on the target. Do not try to aim with your finger, point! Ready? "Pull." Did anyone have a problem getting their finger on the target? Realign your stance to the area where you got on the target. This concentration on the target and pointing technique will make you successful with the shotgun. Try bringing your finger up and pointing at several more targets.

Finger Point and Bang!



Now let's repeat the same exercise with a new twist. This time the instant your finger touches the target, I want you to "break the target" by shouting "BANG!" Remember to follow through. [In most groups a few shooters will be significantly slower than the majority. Stress the importance of saying "Bang" the instant the finger touches the target. Some groups will tend to "bang" in unison. It is very unlikely that all shooters will get on the target simultaneously. Emphasize that they should say bang when they get on the target, not when others do so.] This process is programming your mental computer to perform instinctively when live firing starts later.

[Repeat this activity as many times as necessary.]

Before we go on to the next step, let's review the basics of shotgun handling. Keep the muzzle of the shotgun pointed in a safe direction always. Keep both the magazine and chamber empty with the action open and exposed to view except when ready to shoot. Note that the action is open, and the gun is unloaded. Visually and physically check the chamber and magazine to assure that the shotgun is unloaded. Finally, keep your finger off the trigger until you are ready to fire. [This should be repeated with each shooter on the line as well.]

Dry Point with the Shotgun

Your first shotgun handling experience will be a repetition of the first three fundamenta1s. Get into your boxer's stance. Be sure you are balanced and facing the target breaking zone. Swing yourself to the right and the left. Can you move freely through either side of the area where you expect to break the target? If not, change your position until you are able to move freely

Assume the gun ready position. I will put the gun in the proper position on your shoulder. Bring your face to the stock and look down the barrel. What do you see? Now I will put the muzzle in the proper place and all you have to do is concentrate on the target. Relax but be ready for action. Watch in the area where the target will appear and call for the target. When the target appears, point the gun at it and follow it all the way to the ground. [Repeat this exercise several times. Be sure to take the shotgun from the shooter and return it each time. Follow the thank-you-you're-welcome procedure each time. During pauses for advice, take the shotgun so the shooter does not tire too quickly.]

Dry Fire

This time, we are going to close the action on an empty chamber and pull the trigger when the shotgun touches the target on the swing. This is known as dry firing the shotgun. It is an excellent way to practice your swing and timing. Any time the action is closed for the rest of the session, I will tell you that the shotgun is loaded and ready to fire. As before, you should treat the shotgun with the respect due a loaded one at all times.

The safety is off; the shotgun is loaded and ready to fire. Again, I will put the gun in the proper place on your shoulder and have the muzzle where it needs to be. Look to the area where the target will appear. Remember to fire as quickly as the muzzle touches the target and to follow through until the target touches the ground. [Repeat this process four or five times.]

Ball and Dummy

When the instructor sees that the shooter is getting on the target and firing, a live round is slipped into the chamber during the loading

process. The shooter will hit the target most of the time. If the shooter is hitting the targets well and handling the shotgun properly, the instructor may elect to permit him or her to load and fire the final round on their own. The shooter should not fire more than about five rounds in this session.

## Summary

Shotgun shooting, like any other sport, requires skill, coordination and a lot of practice. Concentration and programming your mental computer with lots of perfect practice will develop your skill and reflexes. Do not be too hard on yourself if you missed a few targets today. Everyone misses some. You probably feel a little tired. Even though we only fired five shots, you "fired" quite a few more. As we continue to practice, your stamina will increase. Continue working on shooting form and you will get better. At our next session, we will review these steps and practice shotgun shooting.

## Summary Activities

1. Have a brief discussion session about things the shooters learned or questions they have about shooting straight-away targets.
2. Teen or junior leaders or assistant instructors can tutor shooters who have had difficulty during the live firing stage.
3. Shooters should prepare to coach each other using the coach pupil method in later stages. In this session, the technique can be used up to the live firing stage.

## Exhibit or Sharing Ideas

1. List things you learned in this session in your shooting journal.
2. Make a poster showing the steps to safe and effective shotgun shooting. Display it in a location where it can be reviewed by other shooters in the program.
3. Share things you have learned in the lesson with an adult or parent who is interested in shooting.
4. Demonstrate the fundamentals of shotgun shooting without a shotgun for your club or another small group.
5. Demonstrate how to pass a shotgun between two persons for your club or another group

SHOTGUNS | Parts Of A Shotgun
Sighting Bead
Muzzle
Barrel
Tube Plug
Ventilated Rib
Forearm
Action
Safety
Trigger Guard
Trigger
Comb
Stock
Butt Plate

# Lesson 4 Narrative Basic Shotgun Knowledge

## History of the Shotgun

Shotguns have been in existence for centuries. Before development of the rifling process, firearms could be used with either a single projectile or multiple projectiles. Shotguns developed as specialized firearms to shoot multiple projectiles over relatively short ranges. In their earliest form, they were used for military purposes. As ignition systems increased in speed and reliability, shotguns became practical for self-defense, controlling wildlife or killing game for food. The shotgun, or **scattergun** as it was often known, served prominently in the early development of North America, both as a good gathering arm and a weapon.

The bell-mouthed **blunderbuss** commonly pictured as the Pilgrim's hunting tool was a **matchlock** arm that was cumbersome and slow to fire. They were used to hunt game that was at rest or moving slowly. The **wheel lock** designs were faster, but they were complicated and very expensive. When the **flintlock** design became available, shotguns became accessible and effective hunting arms and the arm of choice for hunting moving game. Cap lock muzzle loading shotguns increased their speed and reliability, and soon they were replaced by single- or double-barrel breach-loading shotguns. Other action types developed rather rapidly, giving us the wide variety of shotgun designs available today.

Shotguns are the arm of choice for swiftly moving targets or situations where a pattern of smaller pellets (shot) is preferred to a single projectile. They still have some law enforcement and military applications, but most of all shotgun use is for recreational purposes. Millions of shooters participate in a variety of shotgun-shooting games using clay targets. The shotgun is also preferred by many hunters for small game, waterfowl, or upland birds. In some areas, the versatile shotgun is even used with specially designed loads of buckshot or a single projectile for hunting big game.

The shotgun usually fires many pellets, called **shot**, instead of a single bullet. Once the shot leaves the barrel it spreads out forming a pattern. The pattern is the area covered by the spreading bullet, increasing the likelihood of hitting the target.

## Parts of the Shotgun

The phrase "lock, stock and barrel" refers to the major parts of a muzzle loading firearm. Modern shotguns are made up of three basic groups of parts: **action** (like the lock), **stock** and **barrel.** They work together to make a functional shotgun.

## Stock

The **stock** is the shotgun's handle. It helps you hold and shoot the shotgun comfortably and accurately. Fiberglass (or other reinforced plastics) and metal stocks are available, but most shotgun stocks are made of hardwood. Each part of the stock performs a function for the shooter. Stock designs affect shot placement, accuracy and shooter comfort. Most shotgun stocks have two sections, divided by the **receiver.** The rear part that fits the shoulder and supports the shooting hand and the cheek is called the **butt stock.** The part that supports the forward hand is called the **for end, forearm** or **fore stock.** On some shotguns movement of the forearm operates the action. Understanding the parts of the stock and how each part influences the behavior of the shotgun aids in shooting more comfortably and accurately.

The butt of the stock is the part that rests against the shoulder when the shotgun is mounted for firing. The blunt, top part of the butt is known as the **heel**. The more pointed, bottom part of the butt is the **toe.** Many shotguns have a **butt plate** made of plastic, metal or rubber attached to the butt. Others have a **recoil pad** made of honey combed rubber in that area. The butt on a few shotguns is simply checkered wood, with or without a metal skeleton around it. The shape and size of the butt is important in proper gun fit and recoil distribution. The vertical distance from the top of the heel to a line extended from the upper surface of the barrel measures **drop at the heel.** The amount of drop at the heel affects both the apparent recoil and the shooter's stance.

The top edge of the butt stock, running from the heel to the grip or wrist is the **comb.** A shotgun is properly mounted when the comb is brought firmly to the cheek. Like the drop at the heel, the **drop at the comb** is important in determining how "straight" or "crooked" a stock will be. Stock straightness is a major factor in regulating the relationship between the point of impact and the shooter's impression of where the muzzle is pointing. Straight stocks tend to pattern higher. Crooked stocks tend to pattern lower. Straight stocks also tend to recoil back rather than upward, reducing the apparent or felt recoil. When the gun is used to shoot rising targets, as in trap shooting, the comb may be built up to raise the **point of impact.**

The **grip** or **wrist** is the part of the stock you hold in your trigger hand. The grip is usually one of two basic shapes. The pistol grip is the most common. The straight or English grip is found on many light-hunting guns. Like building up the comb, the straight grip tends to raise the point of impact. The grip is often checkered to give the hand a more secure hold.

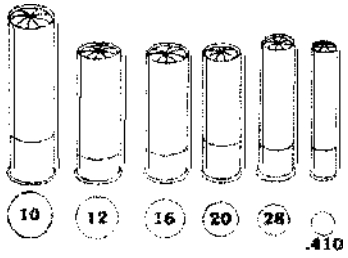
The part of the stock located under the barrel is called the fore stock, for end or forearm. Like the grip of the butt stock, the for end is often checkered, carved or otherwise sculpted to increase the security of the grip by the forward hand.

Barrel

The **barrel** is simply a tube through which the shot passes on its way to the target. The end of the barrel that holds the unfired cartridge is the **breech end.** The end from which the fired shot emerges is the **muzzle**. Since the muzzle points toward the impact area, muzzle direction must be controlled at all times to ensure safety.

The inside of the barrel is called the **bore.** Most shotguns have smooth bores, although a few specialty barrels may have straight or spiral rifling. In contrast, rifle barrels almost always have a spiraling set of lands and grooves that cause the bullet to spin, thus increasing its stability in flight.

Today most shotguns are manufactured in one of six standard bore diameters. Bore diameters are measured in **gauges.** Gauge is a measure that originated in England long ago. Gauge was determined by the number of bore-diameter lead balls that could be cast from one pound of lead. Thus, the smaller the gauge number, the larger the diameter of the lead balls and the shotgun bore. A 20-gauge shotgun (20 lead balls to the pound) is substantially smaller in bore diameter than a 10 gauge (10 lead balls to the pound). Most shotguns are manufactured in six standard sizes. The modern gauges, starting with the largest bore, include 10, 12, 16, 20 and 28-gauge guns. The sixth standard boring is the .410 bore. This exception to the rule for shotgun sizes, this one is a .410 caliber, that is, its bore is 410/1000 inch in diameter. If expressed as a gauge, the .410 would be a $67^1/_2$-gauge gun. Standardized ammunition sizes and barrel dimensions for each of these shotgun borings have been established by the arms and ammunition manufacturers. For safety reasons, cartridges designed for different borings should *never* be mixed. Ammunition for some boring will lodge in the barrel of others with potentially fatal results. Most shooters know that a 20-gauge shell will lodge in a 12-gauge barrel, but other potentially deadly combinations exist. Sixteen-gauge shells will lodge in 10-gauge barrels, and 28-gauge shells will lodge in 20-gauge barrels.



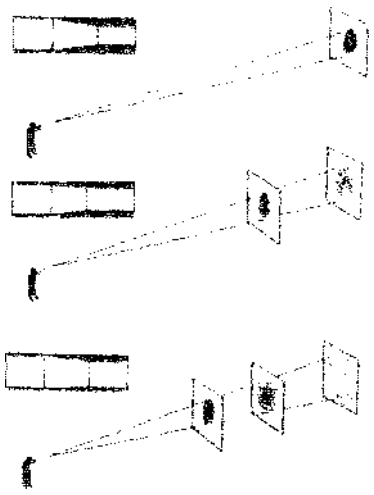

Externally the shotgun barrel appears to be a simple tube, usually with a small bead near the muzzle. It may also be fitted with a solid or ventilated rib. In some over/under doubles the side ribs are also ventilated to help disperse heat. Almost all shotgun barrels have one or more beads on them. Field guns usually have an additional smaller bead midway along the rib. These reference points may be made of metal, plastic or a combination of materials. Shooters may refer to them as sights, but they are merely reference points. Proper shotgun shooting calls for the gun to be pointed rather than aimed.

(Refer to Supplement Sheet # 6)

Internally shotgun barrels are more than just a tube. At the breech end, they have a chamber designed to fit snugly around the appropriate shotgun shell. Beyond the chamber, the tube may have a uniform diameter; but most shotguns have some constriction at the muzzle end of the barrel. That constriction is called a **choke**. The

choke controls how fast the shot will spread out after it leaves the muzzle. Within a rather narrow range of tolerance, increasing choke constriction decreases shot dispersal. By keeping the shot in a more restricted area (a tighter pattern), the density of the pattern is increased. That increases the effective range of the shotgun, allowing the shooter to fire at longer distance. Selecting the appropriate choke for the type of shooting being done is part of learning to use a shotgun effectively.

A series of "standard" chokes are defined by the arms and ammunition manufacturers. These definitions include a range of tolerance, and they may differ among manufacturers or between guns. A shotgun with no choke constriction has a cylinder bore. Listed in order of increasing amounts of constriction the standard chokes include: cylinder, skeet, **improved cylinder, modified,** improved modified, **full** and extra full. (The ones in bold print are most commonly seen in field guns. The others are found mainly in target guns or those designed for special purposes, like long-range water fowling, turkey hunting or shooting slugs.) A full or extra full choke shotgun has the tightest constriction and the greatest range. At close range a full choke pattern can be too small to consistently hit a moving target. When a close target is hit, the pattern is so dense that a clay target is "smoked" (reduced to a cloud of dust) or a game animal is ruined. The modified choke has less constriction than a full choke. The modified choke will have a shorter effective range than a full one, but a wider pattern at close ranges. The improved cylinder choke is less constricted than the previous two and gives a wide pattern at close range.



Three basic types of chokes are available in modern shotguns. First, in many shotgun barrels the choke is an integral part of the barrel, built into it during the manufacturing process. In other barrels, a threaded portion of the barrel may accept short tubes with different choke constrictions built into them. Having a variety of choke tubes that may be used greatly increases the versatility of a shotgun. The tubes are small enough to be easily carried in the field or to the range. The third choke design is a collet-type that is adjusted by rotating a collar. As the collar is tightened, the collet moves a set of thin steel blades closer together. That increases the choke constriction and degree of choke. These devices are attached to the barrel after it is made. Different chokes are obtained by adjusting the collar to the proper setting.

## Action

The moving parts that allow you to load, fire and unload the shotgun are called the **action.** Most of these parts are housed in a metal frame called the **receiver**. There are many different types of actions, among the most common are **hinge, bolt, pump** or **slide** and **self-loading** or **semi-automatic**.

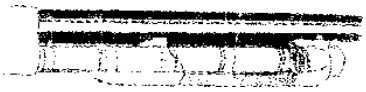
In nearly all cases, the action cocks a shotgun by compressing a main spring that drives the **firing pin** or **hammer**. The spring-loaded

hammer locks in place until released. Loading is done by opening the action and placing a shot shell into the chamber (or a loading port) at the breech end of the barrel. Then the shell is locked in place with a bolt or breech block as the action is closed. Operating the action on many shotguns requires you to activate a button or lever called the **action release.** The cocked and loaded firearm can be fired immediately and should always be treated with care and respect. On a target range, the shotgun should be loaded only in immediate anticipation of a shot and according to the rules of the game being shot. When in the field (hunting), the **safety** should be placed in the ON position. A safety is a mechanical device. Like other mechanical devices it may fail to operate properly. Ultimately safety depends on the person holding the shotgun. Never point a gun at something you are not willing to shoot. We will learn more about safe gun handling in a future lesson.

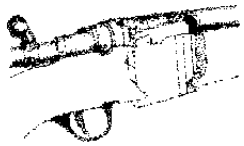
To fire the shotgun, move the safety to the OFF position (if it was ON). Then simply press the **trigger.** That releases the spring energy stored by the opening of the action, causing the firing pin to strike the battery cup and fire the round. The trigger is the lever pressed to fire the shotgun. It is surrounded by a **trigger guard** to help prevent accidental firing. The trigger finger should stay outside the trigger guard until you are ready to shoot – under all circumstances. Under hunting conditions, the finger acts as an additional trigger guard to prevent brush or other obstructions from reaching the trigger. Remember – ALWAYS keep your finger outside the trigger guard until you are ready to fire.

**ALWAYS keep your finger outside the trigger guard until you are ready to fire.**

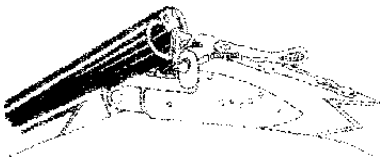
Some types of shotguns have a **magazine**, a part of the action that stores additional shot shells until they are ready to be used. Operating the action ejects the fired shell and loads a fresh one into the chamber. Some bolt-action shotguns have clip-fed magazines, but most shotgun magazines are tubular and located immediately below the barrel. A careful shooter always checks both the chamber and magazine of a shotgun to be sure they are empty before handling it.



**Action Types**

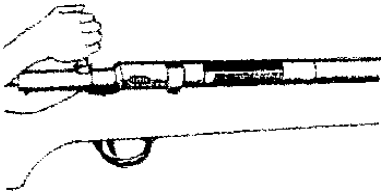


There are four basic action types commonly used in shotguns. One of the oldest designs is the hinge or break action. This action operates much like a hinge on a door. The action is opened by pressing the action release lever (usually to the right). The barrel(s) are then pivoted down, exposing the chamber(s) of the shotgun. This cocks the action and lifts spent cartridges to ease removal or ejects them by spring action. To load, place live round(s) in the chamber(s) and close the action. Hinge-action firearms are easily checked to see if they are loaded or if the barrels are obstructed because the shooter can physically see down the barrel(s). Shotguns of this type come in three basic forms. Many single-shot break action models are available. Some of them are inexpensive, and other are among the most expensive shotguns made. Double-barreled shotguns (doubles) come in two basic styles. The barrels may be fixed **side-by-side** or stacked vertically. Those with the side-by-side arrangement are

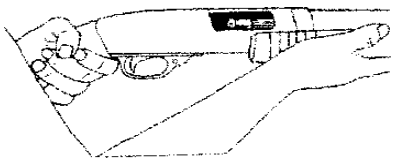


known as doubles or side-by-sides. Those using the vertical arrangement are called **over/under.**

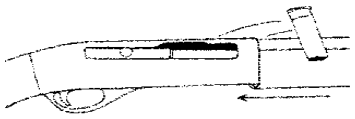
**Bolt-action shotguns** operate on the same principle as a door bolt. Much more common in rifles than in shotguns, the bolt action is strong but relatively slow. Bolt-action shotguns are usually relatively inexpensive guns. Lifting the bolt handle cocks the shotgun, and drawing the bolt back ejects the spent cartridge. A new one loads when you push the bolt forward and rotate the bolt handle downward, locking the action closed. These shotguns are suitable for many types of hunting, but slow cycling and awkward action for a second shot makes bolt actions a poor choice for most clay target games. Bolt action shotguns are readily available, but probably the least common action in use today.



**Pump or slide action shotguns** resemble a trombone or an insect sprayer in action. Pulling the forearm back toward the receiver cocks the action and ejects the spent shell. Pushing it back toward the muzzle loads the next round and locks the action closed. If the shotgun is not fired, the gun remains in a closed and locked condition until an action release (usually located near the trigger guard) is pressed. Experienced shooters can fire several rounds in rapid succession, often as quickly as a shooter using a semi-automatic shotgun. Many hunters use pump action shotguns because they are reliable, positive and durable under all sorts of weather conditions.



**Semi-automatic actions** could be more properly called "self-loaders." The action uses some of the recoil energy or gases from a fired shot to cock the hammer, eject a spent round and load a new one. Most semi-automatics lock open when the magazine is empty. A fresh round can be loaded by inserting a shell into the loading port when the bolt is locked back. Pressing the action release allows the action to close by spring tension. In normal operation, the shooter merely pulls the trigger to shoot a second round. The trigger is equipped with an interrupter, so it must be released between shots. Self-loading shotguns are extremely popular with both target shooters and hunters. Most models are heavy compared with other action types in the same gauge. The weight can help smooth a shooter's swing, and the quick follow-up shot requires little effort. By using part of the recoil energy to operate the action, semi-automatics spread the recoil energy over a longer time and reduce its impact. Most semi-autos require more care to keep clean and function smoothly than other types of shotguns.



## Shotgun Ammunition

Modern shotgun ammunition is composed of five basic parts. The **case** or shell is a container for the rest of the components. The initial spark is provided by the **battery cup** or shot shell primer. Like other ammunition, shot shells contain a powder charge. The powder is separated from the shot or other projectile by a **wad column** of some type. Most shot shells carry a charge of **shot**; but some are designed to use a single projectile usually a **rifled slug.**

(Refer to Fact Sheet #9)

The most common types of shot shell cases or shells are made of paper or plastic, but brass cases are available from some sources. The **head** of the shell is the part that is in the rear of the chamber when the shell is loaded in the shotgun. The flat, back portion of the head is marked with information on the manufacturer and gauge of the shot shell. This material is known as the **head stamp**. The **rim** of the shot shell's head serves two primary functions. It provides the proper **headspace** for the cartridge in the firearm's chamber and allows the shot shell to be extracted from the chamber. Most shot shells have metal rim, but some have a case composed entirely of plastic including the rim. In shells with a metal head, the length of that head varies considerably. In most modern shot shells, the height of the metal head on the body tube has very little to do with the strength of the tube itself.

The shot shell case contains a base wad at the head end of the tube. In compression-formed plastic cases the base wad is an integral part of the case. In composite cases, those made up of several parts, the base wad may be a separate plastic unit, rolled paper like the case body in design or another material. The base wad strengthens the head of the case.

The case or body tube holds the other components in place prior to firing, keeps them in proper relation to one another and provides an initial seal for the gases produced by the powder. The **case mouth** is crimped to maintain the integrity of the shell.

**Crimps** come in two basic designs. Rolled crimps are used in conjunction with rifled slugs, sabots or overshot wads. They are formed by simply tucking the end of the body tube back inside itself forming a smooth rim. Folded crimps lock the end of the body tube into a series of six or eight pie-shaped wedges with adequate pressure to lock them in place. Most modern shells containing shot use a folded crimp.

The battery cup is the shot shell primer. It contains a pressure sensitive chemical that detonates when compressed between the base material of the battery cup and the internal anvil. The flash from the process is directed through the opening in the top of the battery cup into the powder charge, igniting the powder.

**S.T.E.M. Connections**

***Reactions...Hot Times***

Nearly all modern shot shells use a progressive, smokeless powder as a propellant for the shot. This powder generates much higher chamber pressures than did the black powder it replaced. The powder charge is listed on the cartridge box in **dram equivalents**. That is an approximate measure of the velocity of the shot charge, based on the velocity that would have been generated by the listed number of drams of black powder.

The wad column serves two primary functions. It seals the powder gases behind the shot charge (**obturation**) and it cushions and protects the shot from being deformed during firing. The wad column may be composed of a single plastic unit or a series of components. The plastic unity combines a gas-sealing skirt with a cushioning section and a shot cup that protects the shot from abrasion on its way down the barrel. Other types of wad columns may use a plastic or card wad to seal in the gases

and a cork or fiber wad to cushion the shot with or without a separate shot cup or plastic liver strip. Plastic units are used by most hand loaders as well as many manufacturers.

The shot charge carries the energy produced by the shot shell to the target. Shot is made from lead or lead alloys, soft iron (steel shot), sintered lead and steel and a few other materials. **Fine shot** is commonly formed by pouring molten material through a screen and allowing it to drop into a water bath at the bottom of a tower. It is commonly available in sizes from BB to #9. The diameter of the shot is approximately 0.17 inch minus the shot size. Thus, #2 shot is about 0.15 inch in diameter and #9 shot is about 0.08 inch in diameter. **Buckshot** is cast in molds rather than in a shot tower. The smallest buckshot is #4 buck, approximately 0.24 inch in diameter. The largest is #000 buck, approximately 0.35 inch in diameter. Rifle slugs are bore diameter projectiles intended for large game. Most American slugs are shaped like an inverted cup. Some European slugs are longer with an attached wad column. Some manufacturers make bullet-like projectiles contained in a set of plastic sleeves or sabots for the same types of uses.

**S.T.E.M. Connections**

***Energy...I Need Energy***

**Pattern density**, the number of pellets per unit or area in the shot pattern, is inversely related to the shot size. Larger shot are more dispersed because there are fewer of them in the shot charge. **Pellet energy**, the striking energy of each pellet, is directly related to the size and mass (weight) of the pellet. Larger pellets retain their energy longer and hit harder than smaller ones. Shotgunners must strike a balance between pattern diversity and pellet energy when selecting shot shells. Usually target shooters use light charges of #9, #8 or #$7^1/_2$ shot. Shotgun hunters match the shot type, size and charge to the hunting conditions and quarry.

**S.T.E.M. Connections**

***Gravity...It's a Drag***

# Common Shot Shell Loadings

Commercial shotgun shells are available to fit a variety of chamberings. The largest shotgun shells readily available in this country are loaded for the 10 gauges. Shells are loaded in two lengths, $2^7/_8$ and $3^1/_2$ inches, with shot charges as heavy as $2^1/_2$ ounces of lead shot or slightly lighter charges of steel shot. Shotguns in this gauge are used primarily in hunting waterfowl, turkeys and big game. They may not be used in any target games.

The 12-gauge shotgun is the most versatile boring available. It has standard chamberings for $2^3/_4$, 3, or $3^1/_2$-inch shot shells. Shorter shells may be used in longer chambers but using longer shells in short chambers results in dangerous pressures. Shot charges of an ounce or less up to $2^1/_2$ ounces of lead shot in the $3^1/_2$-inch case are available. Steel shot is readily available for 12-gauge guns in all case lengths.

Standard loadings for the 16 gauges are $2^3/_4$-inch cases loaded with shot charges of 1 to $1^1/_4$ ounces of lead shot. Though less common than 12-gauge ammunition, steel shot for 16-gauge guns is readily available. Users of older 16-gauge guns should be certain that the chamber is actually $2^3/_4$ inches, since earlier guns may have been made with chambers slightly shorter.

Second only to the 12 gauges in versatility, the 20 gauge is manufactured with either $2^{3}/_{4}$ or 3-inch chambers. Shot charges from the standard target load of $^{7}/_{8}$ ounce to $1^{1}/_{4}$ ounces of lead shot are available, as are charges of up to 1 ounce of steel shot. As with other gauges having several chamber lengths available, shorter shells may be used in long chambers, but the reverse condition is very dangerous.

The 28 gauge is available in the $2^{3}/_{4}$-inch chamber length only. This smallest shotgun gauge is commonly loaded with either $^{3}/_{4}$ ounce or 1 ounce of lead shot. Steel shot is not available.

The .410 bore is loaded in $2^{1}/_{2}$ or 3-inch cases. The shorter case is normally loaded with $^{1}/_{2}$ ounce of lead shot. The longer case carries an $^{11}/_{16}$ ounce shot charge. As with the 28-gauge, steel shot is not available.

Two potential hazards bear repeating. Use of longer shells in any chamber that is not designed for them is very dangerous. Be sure to check the chambering of the shotgun before selecting ammunition. The second potential hazard lies in the potential of one gauge of ammunition lodging in the bore of a larger gauge. Three deadly combinations exist: 16 gauges in 10-gauge, 20 gauges in 12 gauges and 28 gauges in 20 gauges. This hazard can be avoided by making sure you carry only shot shells for the gun you are shooting at the time and **never** mixing gauges of shot shells.

# Summary

Shotguns come in several different borings and action types, but all of them share some common parts. Everyone has a stock, action and at least one barrel. From the tiny .410 bore to the 10-gauge magnum, shotguns are relatively short-range firearms designed to shoot a cluster or pattern of shot. Gauges are now standardized, but they were based on the number of bore-sized lead balls that could be cast from a pound of lead. The spread or dispersion of shot is controlled by the amount of constriction or choke in the barrel. We discussed factors to consider when looking for a shotgun, and how to tell a rifle from a shotgun (at least most of the time).

**Absolutely no live ammo should be permitted in the area!**

Be sure to review this material before the next meeting. If you do not understand something, write it down and bring your questions to our next meeting. Next time we will learn about safe gun handling.

## Summary Activities

1. Use an informal quiz to review the material covered.
2. Relate shotgun action types to common household items and review the action types.
3. Have older members or junior leaders prepare and present demonstrations illustrating certain points.
4. Break the group into small clusters. With an adult or junior leader in charge of each group, have them handle each type of shotgun available, loading and unloading them using inert ammunition (such as action providing dummy rounds). ABSOLUTELY NO LIVE AMMO SHOULD BE PERMITTED IN THE AREA!

## Sharing or Exhibit Ideas

1. Discuss the parts of a shotgun, action types or ammunition parts with an adult or another shooter using diagrams or illustrations.
2. Construct a quiz board covering shotgun parts or action types.
3. Make and display posters of shotgun action types or parts to be used in teaching the shotgun program.
4. Study the history of shotguns and their role in the settlement of North America. Prepare and share a report on your discoveries.
5. Demonstrate principles of shotgun safety and proper shotgun handling.
6. Demonstrate how various shotgun actions operate using dummy or inert ammunition.
7. Study the importance of stock fit and present a report on it to your group or another group of interested people.

# Lesson 5 Narrative - The Next Steps

R.L. Harris

After students have fired their first shots with the instructor handling all the ammunition, loading the gun, and properly placing the gun on the shoulder of the student, the next step is to let the student learn the proper way to load the gun, mount the gun, and know what to do in the case of a malfunction.

By the time you return to the range, you will have covered parts of the shotgun, action types and how they function. Let each student operate all the different types of actions and cover the safety issues associated with each one.

Semi-Automatic

The action release closes the action. Keep fingers out of the action! The gun is designed to take a shell out of the magazine (a tube below the barrel) and put it into the chamber. All you must do is drop the shell into the action with the crimped end toward the chamber. The gun will do the rest. Different makes of semi-automatics operate differently. Some actions will not stay open unless the gun has been fired or a lever has been tripped. Show students how to disassemble various semi-automatics. Have them check the barrels to make sure the gun does not have an obstruction. Examples of potential obstructions include squib loads, dirt or mud.

Pump-Action

The action release allows you to open the action if it has not been fired. Once again, keep fingers out of the action! This action is also designed to take a shell out of the magazine and put it into the chamber. Action releases are in different places on different makes of guns. Have different models available to demonstrate. Show how to take the different makes apart to check the gun to make sure it is safe in case of a squib load or the barrel contacts the ground.

Break Actions

There are three types of break actions - side by sides or double barrels, over under, and single barrels. The action release allows you to open the action on all of these. This action type is the easiest to make sure you don't have an obstruction in the barrel. All you must do is open the action and look through the barrel or barrels. Most of the safeties on this type of firearm are on the tang behind the action release lever. Some of these safeties also serve as a barrel selector to choose which barrel will fire first on the side by side and over under guns. Some of the barrel selectors are located behind or in front or the trigger. Most field guns reset the safety every time the action is opened. Make sure you take the safety off every time you open the action to load it. Most target guns do not reset the trigger when the action is opened.

You will have also covered chokes, their function, and how to choose the proper one for what you will be shooting. Shotguns fitted with choke tubes should never be fired without the chokes in

place. Most fixed choke barrels have markings on the barrel that tell you what choke that barrel has. The three basic chokes that most guns come with are Full, Modified and Improved.

- Full- Long range choke with an effective range up to 50 yards (the tightest)
- Modified- Medium range choke with an effective range of 25 to 40 yards
- Improved Cylinder- Short range choke with an effective range of 20 to 35 yards.

Let your students check the chokes to make sure they have the proper chokes in the guns they will be using.

Ammunition should have also been covered with the students before letting them handle ammo and load the guns. Show them where the gauge is stamped on the barrel and make sure they have the proper gauge for the gun they will be using. The length of the shell is also stamped on the barrel. Go over ammo selection (target loads versus game loads). This will be important when the students start buying their own ammo to bring to practice.

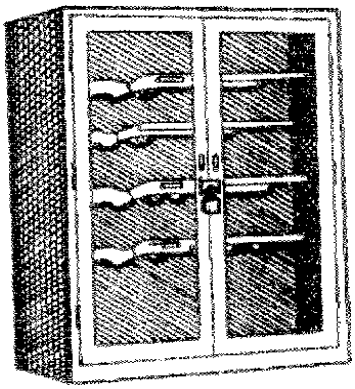
## Firing the Next Shots

We are going to pick up where we left off at the range. Start out by letting the students watch a target, finger point at one, and finger point and bang at one. We want to keep reinforcing pointing, not aiming. Start by loading the firearm and properly placing the gun on the shoulder of the student. Let the student shoot one target. Take the gun back just like you have been doing. The next step is to get the student to assume the gun ready position that was covered previously. Hand them the unloaded gun using the same "Thank You"/"You're Welcome" procedure we have been using. Tell them to bring the gun to their face then back to their shoulder. Let them practice this several times. If they are mounting the gun satisfactorily, take the gun and let them rest a little bit. While you have the gun, tell them that you will be handing them the ammo and letting them load the gun. The next step is for them to close the action making sure to keep their fingers out of the action and the muzzle pointed in a safe direction. Let the student mount the gun and if needed, direct the muzzle to the correct hold point position. Get them to call for the target and shoot it.

We have added several new steps for the student to think about. Try to keep their focus on the target. As a last resort, go back to mounting the gun for them to get them back to breaking targets.

After they have mastered loading and mounting the gun, the next step will be letting them handle their own ammo and keeping control of the gun. Be sure to go over cease fire and what they need to do because up until now you were taking the gun from them every time they shot. This is going to be a judgment call that each instructor will have to make as to when to let them assume this responsibility.

# Lesson 6 Narrative – Caring for Your Shotgun



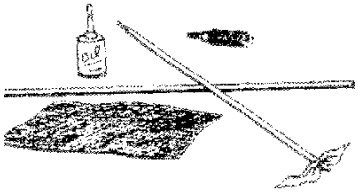
Purchasing a shotgun is a major investment. Those made by modem manufacturers, even some very inexpensive models, are designed to give years of service. With proper care and use, they should last a lifetime and become treasured bonds across generations of shooters. Keeping your shotgun clean and properly maintained ensures years of trouble-free service and maintains the gun's value. That can be helpful if you wish to sell or trade it for a different model or gauge later. Proper care supports appreciation of shotgun values as well. Nearly all models have increased in real value in the past and the trend is likely to continue.

Proper storage is also important. Storage must provide proper protection for the shotgun, preventing children or other untrained persons from having access to it. Security is also essential.

A shotgun must be protected from damage during transport. It also must meet all laws governing transportation of firearms. Finally, proper transportation must provide security for the gun. Proper storage, transportation and cleaning of your shotgun protect your shotgun, other people and you.

**Cleaning Your Shotgun**

How often should I clean my shotgun? Ideally the shotgun should be cleaned after every use. The degree of cleaning varies with the amount of use and the conditions under which that use took place. If used very little or merely carried without shooting under dry conditions, a simple one-pass bore swabbing and wiping the exterior surfaces may be adequate. After heavy use, or any time the shotgun is used under wet conditions or exposed to salt water or acid rain, cleaning may require complete disassembly and thorough cleaning inside and out. The same procedure should be followed if the shotgun is going to be stored for an extended time.



**Cleaning Equipment and Supplies**

commercial cleaning kits supply the necessities for proper Most shotgun cleaning. Your shotgun owner's manual or the manufacturer will tell you what is required in proper maintenance. Assemble the materials and equipment needed to do the job. General cleaning and maintenance requires the following items.

Cleaning Rod and Accessories

Shotgun cleaning rods usually have a relatively large shaft diameter and an adapter to handle standard shotgun cleaning aids. They should be at least 10 centimeters (6 inches) longer than the barrel being cleaned. Most shooters find a need for a bronze bore brush in the right gauge, a cleaning jag to hold cleaning patches and a cloth bore swab or mop of the proper gauge. The rod and its attachments

with an appropriate solvent is used to remove dirt, powder residue, unburned powder, lead fouling and plastic residue from the bore. It is also used to dry the bore and to apply rust preventive materials.

Cleaning Patches

A good supply of cleaning patches is necessary for any firearm cleaning session. They should be the proper size for the firearm you are cleaning. They can be made from soft absorbent cloth, old T-shirts, flannel or muslin. Commercial patches from these materials or synthetics designed specifically for cleaning shotguns are also available. These patches are used to remove fouling from the bore and to apply solvents or protective coatings.

Solvent

Several excellent general gun-cleaning solvents are available commercially. The residues and dirt that accumulate in the shotgun bore may be difficult to remove. Read the label and match the solvent to the task. Some solvents contain noxious compounds and must be used in a well-ventilated area. General-purpose solvents work well for cleaning a shotgun. Products specifically designed to remove metal fouling from rifle barrels may not work properly.

Lubricating and Corrosion Protection Products

The moving parts of the shotgun require very light lubrication with a light machine oil, gun oil or gun grease. Use the minimum amount needed to accomplish the task. Excess lubricant can foul the action, slow functioning or induce rot in wood parts of the shotgun. Metal parts may also require use of some corrosion protection product.

Gun oil may be adequate for minimally demanding conditions. Synthetic products often provide tougher and more durable protection. Check the manufacturer's recommendations for the types and amounts of lubricants on your particular shotgun.

Other Gun Cleaning Materials

Screwdrivers with blades designed to fit gun screws or punches may be helpful in disassembly and cleaning operations. The cleaning kit should also contain one or more clean rags, a chamber brush, a small brush or toothbrush and a small supply of pipe cleaners. These will be helpful in cleaning actions and other hard to reach spots.

## General Cleaning Techniques

Although it is impossible to tell you how to clean every specific shotgun action type, model and make, some general procedures are commonly used. Each part of the shotgun is cleaned using techniques that are easily transferred from gun to gun.

Cleaning the Bore

A fouled bore is cleaned by using a series of tools in sequence. Where easily accomplished, the barrel(s) is removed from the receiver for cleaning. A bronze brush of proper size for the gauge is attached to the

cleaning rod, saturated with solvent and swabbed through the bore to dislodge any fouling. Once the fouling has been loosened, it is removed using a series of cleaning patches on a jag or bore swab. Patches saturated with solvent are followed by clean ones, leaving a dry, clean bore. If desired, a lightly oiled patch may be run through the bore to leave a very thin film of protective oil in the bore. A chamber brush may be helpful in cleaning the chamber. In semi-automatics, a clean, dry chamber may be critical to smooth functioning. When applying lubricants, do not fall prey to the notion that "if a little bit is good, a whole lot is better." Too much lubricant is worse than none.

Action Cleaning

The interior action parts of slide-action or semi-automatic action shotguns need periodic cleaning. Most of them are easily removed modules. They can be cleaned of debris and dirt with a brush and solvent. When the fire-control mechanism is removed, the action can be further stripped, allowing the receiver, bolt, action rods and other parts to be cleaned as well. Lubricate moving parts sparingly with appropriate materials. On gas operated semi-autos, the gas ports need to be kept clean and the exterior of the magazine tube and the associated gas containment mechanism must be clean and dry. Lubricants tend to collect powder residues and gum the operating mechanism quickly.

Stock Maintenance

Stock maintenance is rarely necessary. Most modern stocks are covered with a polymer or varnish finish that is durable, weather resistant and tough. It does not need oil or other treatment. Scratches or scrapes may be repaired by applying diluted varnishes or thin layers of polyurethane. Oil-finished stocks may be refreshed by using boiled linseed oil diluted with turpentine or mineral spirits.

External Metal Treatment

Light gun oil may be adequate under light duty conditions, but silicone-based materials that displace moisture and prevent corrosion may do a better job. Avoid the temptation to use excessive amounts of any material. A little is enough; a lot just causes problems. Dirt, fingerprints and even solvents in some plastic shot shell cases can start corrosion. Use a lightly treated rag to keep the metal clean and the protectant in place.

Minimum Maintenance

Minimum maintenance should include wiping down the external parts of the shotgun, swabbing out the bore with a dry patch and ensuring the shotgun is empty before it is put in the rack or case.

Bore and Surface Cleaning

The guidelines above for surface metal, stocks and bore maintenance should be followed. The shotgun should be checked once more to be sure it is safe before being put away.

Field Stripping and Complete Cleaning

All the steps outlined above should be followed. If you are not confident about any operation, seek the assistance of a veteran shooter who is familiar with your shotgun or consult a gunsmith. Professional cleaning may be essential in some circumstances.

Preparation for Long-term Storage

Once the shotgun is thoroughly cleaned and checked to be sure it is safe, it may be placed in storage. As a safety precaution, you may want to use a chemical or electrical desiccant to keep moisture under control. Periodic checks of stored firearms are wise.

# Proper Shotgun Storage

All firearms should be stored where they are not easily accessible to small children or other untrained persons in your home. Firearms attract attention and are very tempting items for people to handle. Assume others do not know how to handle any firearm properly until they have demonstrated a sound knowledge of proper handling. Storage to prevent improper handling can be ensured by storing all firearms in a safe condition, storing ammunition separately and using a locked chest or display cabinet. These cabinets provide relatively secure storage among people who do not wish to violate the obvious barrier. They provide very little security from theft. Shooters who want a more secure storage utilize heavy metal vaults or "gun safes." These units are usually bolted to the floor and provide maximum security for your valuable firearms.

As a minimum-security measure, guns should be locked away, with access by youngsters or visitors denied. Shotguns placed in storage should be clean and protected from corrosive residue, moisture and fingerprints. Long-term storage makes these considerations even more important. Keep your ammunition in a cool, dry place. It is best to store guns and ammunition in separate places. The last thing you should do before storing a gun is to see that it is unloaded. The first thing you should do when taking a gun from storage is to check to be sure it is unloaded. This is especially important when more than one person has access to the guns.

# Transporting Firearms

Rules and regulations for transporting firearms differ among states and among localities. Federal law governs interstate transportation and transporting firearms on common carriers like airlines. It is your responsibility to understand and abide by regulations in your area.

The National Rifle Association, state associations, common carriers and the place where you purchased your shotgun may be able to help you understand the regulations on transporting firearms.

Having an unloaded gun in a secure case locked in a secure area will comply with most laws. It is also a wise practice in other ways.

It avoids irritating people who do not like guns or any evidence of their presence in society. By putting yourself in their place, you may be able to see that avoiding the obvious gun in the vehicle avoids problems. It also prevents thieves from locating your shotgun readily and liberating it for their personal gain. Inaccessibility and secure storage are a wise choice when traveling.

## Summary

Shotguns have real value that can appreciate over time. The care and cleaning of the shotgun has a major impact on that value as well as on the functioning and safety of the gun. Cleaning is relatively simple, but specific differences exist among action types, makes and models. We practiced the fundamentals of keeping the shotgun clean and in top condition. Considerations for proper storage and security were also discussed. Finally, we considered some of the elements of shotgun transportation including legal considerations, security and the public image of shooters.

## Summary Activities

1. Allow each individual or coach-pupil pair to clean a shotgun under the supervision of a qualified volunteer or teen leader.
2. Arrange a presentation on local firearms laws and regulations by an appropriate person.
3. Use a question and answer format to review the content of the lesson with the shooters.
4. Display several shotguns with descriptions of situations related to their use and have shooters prescribe appropriate cleaning needs.

## Exhibit and Sharing Ideas

1. Enter important things you have learned in your shooting journal.
2. Demonstrate the proper way to clean a shotgun for a parent or other interested adult.
3. Construct a display of shotgun cleaning equipment and supplies, cleaning techniques for a given shotgun, shotgun storage or transportation laws or suggestions.
4. Develop a method demonstration of firearms cleaning, storage or transportation.
5. Explore the value of a *selected* make and model of shotgun over a period of 20 or more years. Show how shotgun condition may affect value. Write a report or construct an exhibit about findings.
6. Conduct a corrosion prevention experiment with several products under controlled conditions using small pieces of steel. Organize results and display in a science fair format or similar public display.