Lesson Narrative

**Introduction**

Archery equipment has been used by hunters and warriors since prehistoric times. The bow could be shot at long ranges, allowing the shooter to stay away from potentially dangerous animals or enemies. Archery target shooting is also old. Without a doubt even cave dwellers held contests to see who could shoot the best.

Early bows ranged from simple staves of wood that were shaped for better performance to strongly re-curved bows that were reinforced with horn, bone or sinew to increase toughness, speed or cast. Bows were designed to meet specific needs. Those to be used while standing or walking were much longer than those used while riding horseback. Thus, the **English longbow** was a far different design than the short, **re-curved bows** used by the Mongols and the Turks.

Modern American archery dates from the middle of the 19th century. As the war between the states came to an end, many people who had to live off the land were denied access to firearms. They relied on bows to live. The Compton brothers wrote of their experiences with the bow during that period. When Ishi, the last Yana Indian, taught the art of making and hunting with archery equipment to Art Young and Saxon Pope, those men began to popularize bow-hunting. The rebirth of archery in the United States began.

Developments in materials and engineering produced as number of resilient substitute for wood. Laminated bows used the strength and cast of fiberglass and the lightness of wood to increase the speed of the bow. Designs changed, adding cast by re-flexing or re-curving the limbs. Still later, mechanical advantages were added as compound bows were developed and their limbs were fitted with eccentric wheels, cams or even crammed limb tips to make the bows faster still.

During this time, other parts of the archer’s equipment were also changing. Arrow material changed from wooden dowels to fiberglass, aluminum or graphite tubes. **Fletching**, once mainly turkey or waterfowl feathers, now includes both hard and soft plastics. Strings went from woven strands of waxed linen to Dacron, Devlar or Fastlight strands with monofilament servings. Arrow shelves were extended toward the string, permitting use of shorter, lighter arrows, producing less arrow flex and greater arrow speed. Sights were added to enhance accuracy and to assist in precise shot placement.

Archery moved into the age of technology, but it continues to be a sport involving hand-eye coordination, consistency and the need for practice to become proficient. Archery remains a sport with relatively slow projectiles shot over relatively short ranges. Basic knowledge and awareness of common safety considerations are necessary for safe, responsible and enjoyable use of archery equipment. Let’s look at some archery equipment and ways for using it safely.
Archery Safety

Arrows are dangerous until they come to a complete stop. The entire flight path, from release until the arrow stops, must be clear and safe. This is the same as having a safe field of fire with a firearm. As with firearms, the arrow should only be pointed in a safe direction. Unlike firearms, however, straight up is not a safe direction. An arrow shot straight up poses an extreme danger while a bullet shot straight up poses very little threat. The arrow is much more dangerous than a high-powered rifle in that situation.

Archery equipment is designed to penetrate with a heavy, relatively slow projectile that has a large amount of momentum. Even target bows have enough momentum to drive an arrow through a human being. Arrows produce very little shock (hydrostatic shock) on impact, but they penetrate much more effectively than rifle bullets. That fact can easily be demonstrated by shooting both types of projectiles into a container of sand or a hay bale. Unlike firearms, archery equipment has multiple points of potential danger to the user or persons standing nearby. The point of the arrow, the arrow’s nock, the tips of the limbs, the nocking point indicator and the string and/or cables of the bow all are capable of producing an injury. Faulty, inadequate or mismatched equipment can also pose a threat to safety.

Bows and arrows can be dangerous penetrating weapons, or safe, exciting and entertaining recreational arms. The difference lies in the mind and the control of the user. While the arrow remains on the string and the string is in your fingers, the arrow is under your mind’s control. When the string is released your control comes to a stop and the law of physics takes over.

Archery equipment must be treated with respect and care. All the principles for safely handling firearms apply to archery equipment as well. The user alone is responsible for safe, responsible and appropriate use. If any doubt exists about the absolute safety of a shot, do not release the string. The safety of archery is in your hands. So, it is essential that simple principles of safe shooting be accepted and enforced. Many of the principles of safe shooting can be summarized in these simple statements.

1. Always be absolutely sure that the path to the target and beyond is clear.
2. Never point a drawn arrow at anything you do not intend to shoot.
3. Always be absolutely certain that the target is clearly visible, safe to shoot and appropriate.
4. Always be aware of the danger areas at the end of the arrow and the tips of the limbs.
5. Place an arrow on the string only when you are ready to take a shot.
Always treat your archery tackle with the respect it is due. Never fool around with it.

6. Never use archery equipment while your mental ability is impaired by fatigue, distractions or the influence of any drug.

7. Always exercise caution when retrieving arrows or removing them from a target.

8. Always be sure that all archery tackle is in perfect working condition and free from damage before it is used.

9. Always abide by the strictest codes of behavior and ethics applied to the archery sport in which you are participating. Including specific range rules.

Perhaps you can think of others that might be added.

An Orientation to Archery Tackle

**Bows**

A bow consists of a handle or **grip**, a center section (**riser**) and a pair of **limbs**. The grip or handle is usually shaped to permit the bow hand to seat well. Just above it is a cut out area known as a **sight window**. The sight window is on the left hand side of the bow for right-handed shooters and the on the right side for lefties. The **arrow shelf** is at the bottom of the sight window. It normally is not used to support arrows in modern bows. Instead, and **arrow rest** is positioned just above the shelf. The portion of the rest that lies along the side of the sight window is called and **arrow plate**. Sometimes it is adjustable. Often shooters install a spring-loaded **plunger** or button to aid in tuning the bow. The entire riser section may be constructed of the same materials as the limbs, or it may be a separate piece of wood or metal. The limbs are usually solid fiberglass, graphite or laminated glass and hardwood. Conventional bows (recurve bows and longbows) have nocks at the end of each limb to hold the string in place. Compound bows have **wheels** or **cams** at the tips of the limbs. They also have **cables** and some other items not found on the conventional bows. The part of the bow that faces that shooter is called the **face** or belly of the bow. The part that faces the target is called the **back**.

**Bow Strings**

Almost all modern bow strings are made from a continuous strand of Dacron or some other string material looped several times. Thus, when one strand of a string is broken, the entire string is broken. Most strings have loops on both ends to fit the string nocks or other means of attaching to the bow. Those loops are protected by windings of heavy thread known as **servings**. A middle serving, often of monofilament, protects the string from wear where the arrow and the fingers touch it during shooting. The middle serving should have one or more **nocking point indicators** (metal, plastic or thread) to locate the arrow in the same place on the string for each shot.
**Arrows**

The projectiles or arrows are tubes or bolts of wood, fiberglass, graphite or aluminum. The stiffness, or spine, of these shafts is matched to the draw weight (strength) of the bow. The end of the arrow that is placed on the string has a nock, usually a plastic device with a notch that holds the string. The other end has some type of point, depending on the type of shooting being done. **Target points** are usually conical or bullet shaped. **Field points** usually feature a point with an elongated and somewhat thinner tip than the main body of the point. **Broad heads** usually have two or more cutting edges attached to a central ferrule. Several other types of points are also available, but they are used by more advanced archers.

Near the nock, the arrow is equipped with some type of fletching. Usually the fletching consists of three shaped feathers or plastic vanes, but some arrows use four or even six vanes or feathers. The fletching may be straight, slightly angled or helical, depending upon the intended use. Its purpose is to help stabilize the arrow in flight. Hunting arrows usually have at least three large vanes or feathers. The fletching on target arrows may be much smaller. **Flu-flu arrows** have massive amounts of fletching to limit the flight distance of the arrow.

Just beyond the fletching, the shaft may be marked with a pattern of painted stripes, called cresting or a signature. The cresting is used either to decorate or to identify the ownership of the shafts. Many target archers, and a few bow hunters, mark each arrow individually so they can watch for differences in performance between them.

**Other Accessories**

The beginning archer needs a few other items to be fully equipped. An arm guard is needed for the bow arm. It should be worn on the inside of the arm between the wrist and the elbow. Arm guards come in a wide variety of types, but all of them help to reduce the pain of string slap (usually an indicator of poor shooting form) and to keep the clothing out of the string’s path. Several types of gear are used on the string hand. Archers use finger tabs, shooting gloves or mechanical releases to hold the string. All have merits and drawbacks. For learning purposes, a finger tab is recommended. The tab is worn on the inside of the index, middle and ring fingers of the dominant or string hand. Most tabs have a split that lines up between the index finger and the middle finger to permit split finger shooting. A single finger attachment is used on the middle finger of the shooting hand most times.

Many types of quivers are available for the first few trips to the shooting line, your “coach” will be the quiver, handing you the arrows one at a time. Later we will switch to using ground quivers. As you progress, you will want to get a quiver (or quivers) that match your shooting needs.
Eye Dominance

Before you learn to shoot, you need to determine your eye dominance. Fact Sheet 3: Determining Eye Dominance provides more information about it and ways to test it. Pick a partner to help test for eye dominance. Stand facing your partner about 2 meters (6 feet) apart. Place one thumb over the other and cross your fingers over the fingers of the other hand, leaving a small triangle. Raise both hands together, keeping both eyes open and the head straight toward your partner. Look at your partner’s nose through the opening. The partner should note which eye can be seen through the opening. Now, keeping the nose in the opening, bring your hands slowly back to your face. Your partner should watch for any “cheating” where the hands seem to wander from eye to eye. The eye that your hands return to is your dominant eye. Now switch roles and try it again. Do not be concerned if your handedness and eyedness are different. A significant minority of the people in the world are cross dominant.

Your best shooting will occur when the dominant eye is on the same side as the drawing or string hand, and the “off” eye is on the same side as the bow hand. All directions will be given using those terms. The handedness of the bow is determined by holding it as you would when shooting. The sight window is on the opposite side of the bow from its handedness. That is, a right-handed bow (for a right-eyed shooter) will have the sight window cut into the left side of the bow and be held in the left hand. Once you have selected a bow that is appropriate to your eyedness, discuss its parts with your partner. If you need help, ask a parent or junior leader for assistance or advice.

Stringing and Unstringing Bows Safely

There are many ways to string or unstring bows. Most compound bows are simple left strung all the time, but recurve bows are usually unstrung between uses. Two methods that should not be used are the push-pull method and the step-through method. The push-pull technique is fairly gentle to the bow but has too many dangers for your eyes. We do not recommend it, even when it is done properly. The step-through method is less dangerous to the archer, but potentially damaging to the bow. We do not recommend it either.

Use some type of bow stringer. They are inexpensive to buy or make, and they save both eyes and bows. Try stringing and unstringing the bow you have selected several times while being observed by your parent. Do NOT draw and release the bow without an arrow on the string! Dry firing a bow is dangerous both to the bow and to the shooter.

Range Procedures

Like other forms of shooting, archery operates under controlled conditions to ensure the safety of all participants. Everyone, not just the
<table>
<thead>
<tr>
<th>Verbal Command</th>
<th>Whistle Command</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Archers to the shooting line</td>
<td>Two blast</td>
<td>Shooters come to the shooting line and straddle it</td>
</tr>
<tr>
<td>Make ready.</td>
<td></td>
<td>Shooters prepare to shoot</td>
</tr>
<tr>
<td>Is the line ready!</td>
<td></td>
<td>“Ready” or “not ready”</td>
</tr>
<tr>
<td>Commence firing.</td>
<td>One blast</td>
<td>Shooters begin firing</td>
</tr>
<tr>
<td>End is complete.</td>
<td></td>
<td>Shooting is complete</td>
</tr>
<tr>
<td>Retrieve (or score) your arrows</td>
<td>Three blasts</td>
<td>Follow line commander to target butts; wait for scoring or pull arrows from target</td>
</tr>
<tr>
<td>Cease fire!</td>
<td>Four or more blasts in rapid succession</td>
<td>Immediately STOP shooting – unsafe condition; wait for commence firing command or one whistle blast to resume shooting</td>
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</tbody>
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NOTE: The line captain ensures that all shooters have returned to the ready area before returning from the butts. *In tournament shooting the archer must remain at least arm’s length away from his or her arrows until they have been told to pull them by the scorer.

Range officer or line captain, is responsible for safety. Any unsafe condition must be brought to the attention of the person in charge IMMEDIATELY. All range commands, whether verbal, visual or whistle must be obeyed immediately. Small groups may be controlled with simple voice commands, but larger groups or tournaments are better addressed with whistle, horn or light commands. For our purposes, keeping the commands as close to those used in other shooting sports is best to avoid confusion.

Several modifications apply in field shooting. Rather than straddling the line like in target archery, the shooter toes the shooting line or stake. In addition, when retrieving an overshot arrow, the archer should place their bow directly across the face of the target to let following archers know that someone is down range and possible in the line of fire. Some archers use an arrow stuck upright in the target butt as an indicator, but the bow is a super sign.

In both types of shooting, archers should be far enough apart to ensure they do not interfere with one another. We will be spacing ourselves about 2 meters (6 feet) apart since our first show will be made using the bow as a shelf for the arrow while nocking it. Later, as you become more skilled at handling your equipment, we can reduce the spacing between shooters to about half that distance. At that point the arrows will be placed on the string while the bow is held more or less vertically. Arrows are never nocked until the command to shoot is given, and bows are never drawn except during live firing or on command.

**Conclusion and Summary**

That concludes the lesson on archery equipment and safety. Are there any questions?
Be sure to review this material before our next session. At that time we will start developing good shooting form on the range. Please mark the bows you have selected by writing your name on a piece of masking tape. Put the tape on the back of the sight window from the arrow rest to the top of the sight window.

**Summary Activities**

1. Have junior leaders or parents review archery terms and safety considerations with small groups of participants.

2. Have junior leaders or parents supervise young people in stringing and unstringing bows using cord, box and wall stringers.

3. Without equipment, have participants practice range rules and behavior either inside or on an outdoor range.

4. If they are not already equipped with nock sets, have each participant locate and attach a nocking point indicator to their selected bow with the assistance of a leader or junior leader

**Exhibit and Sharing Ideas**

1. Make posters of range rules, archery safety principles or archery tackle with parts identified.

2. Construct quiz boards that match parts with points indicated by letters, numbers or other means.

3. Construct and demonstrate a bow stringer.