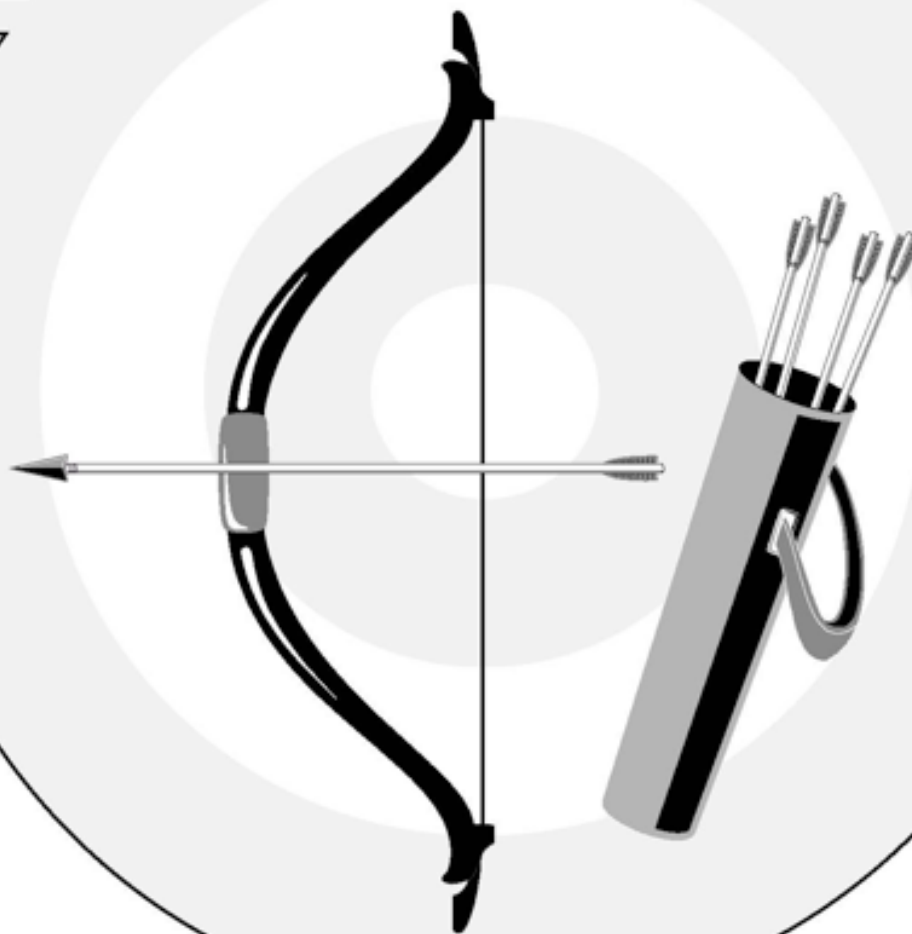


 EM4426

WASHINGTON 4-H ARCHERY PROJECT





WASHINGTON 4-H ARCHERY

HISTORY OF ARCHERY

The bow and arrow have been used as a tool for hunting for at least 50,000 years. Flint arrowheads used years ago can still be found in some parts of Washington. The bow also protected persons from their enemies, as well as secured their food. Expert archers won early military wars. Thus, archery became a symbol of power and was included in the seal of the United States. According to the Encyclopedia Britannica, the invention of the bow was one of the three most important cultural advances in history, equaled in importance only by the discovery of fire and the development of speech. It also became a symbol of romance through tales of Robin Hood and Cupid.

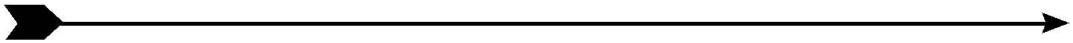
History of 4-H Archery in the State of Washington: The first 4-H State Tournament to qualify an archer to attend the National 4-H Shooting Sports Tournament was held in Bremerton, Washington in 2006 - 2008. Since those first times, these state tournaments have been held in Ephrata 2009, Puyallup 2010, and Eatonville 2011 - 2016. The original tournaments in Bremerton and Puyallup were just the archery division, whereas the tournaments in Ephrata and Eatonville included all shooting sports divisions. Only 4-H members that are Seniors may participate in National 4-H Shooting Sports Tournament, and they may only participate once in each division, recurve/barebow and compound.

Washington State Archery Association constitution was written in 1970. Their goal is to foster, expand and perpetuate the practice of archery in cooperation with the National Associations, to encourage the use of the bow in hunting all legal game birds and animals; to cooperate with all organizations in the policy of conservation and the propagation of game and wildlife.

Since the National Archery Association began in 1879, archery has become a popular sport. Millions of people now enjoy archery as a sport. We hope you will, too.

USA Archery is the governing body for the United States Olympics.

Archery offers something for everyone including the person that shoots for fun in their back yard, to the challenge of competition or the heart pounding thrill of hunting with a bow and arrow.



What Can You Learn through this Project?

1. To select and care for a suitable bow and arrows.
2. To shoot a bow and arrow accurately and safely.
3. About birds and animals and wildlife conservation.
4. About shooting regulations.
5. To enjoy archery as a sport.
6. Decision making, teamwork, self-discipline, self-confidence, and problem solving.
7. To promote the highest standards of safety, sportsmanship, and ethical behavior.
8. Encourage an appreciation and understanding of natural resources.
9. Develop leadership abilities.
10. Build character and willingness to assume citizenship responsibility.
11. Furnish enjoyable, positive relationships with peers and adult instructors.
12. Strengthen families through participation in lifelong recreational activities.
13. Build awareness of related career opportunities.

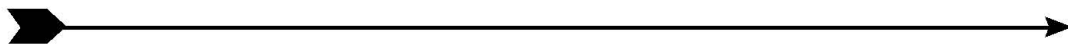
What Is Expected of 4-H Members in this Project?

1. Be a member of a club. Archery should not be taken as an individual project.
2. Help plan a yearly club program, which includes individual goals for each member.
3. Attend club meetings regularly. Be an active, cooperative member.
4. Learn and practice archery safety.
5. Participate in some field trips and/or archery matches.
6. Give a presentation on some phase of archery.
7. Complete a yearly Record Book and keep a Permanent Record up to date.
8. Participate in the Archery Advancement Program.
9. Participate in your club's community service project.
10. Exhibit in your county, regional or state fair.



GENERAL ARCHERY SAFETY RULES

1. Always remember that my bow is a deadly tool and I will do nothing that might endanger others. In 4-H we do not shoot at human targets including zombies.
2. Know and obey the range rules.
3. Keep all arrows in their quiver until ready to shoot.
4. To carry arrows in your hands, carry them securely with both hands around all of the arrows, and with your palms facing down. However, the best way to transport an arrow is safely in its quiver.
5. Be sure the area around and beyond your target is clear before you shoot. Never draw a bow if anyone is in front of the shooting line.
6. Always aim and shoot at a definite target; never shoot just for the sake of shooting. Be sure of your target and that it is safe to shoot at it. If you are not sure, take a closer look. If, after a closer look, you are still not sure, do not shoot.
7. Shoot only at targets that are thick enough to stop your arrow. Do not shoot if there is any chance your arrow might ricochet (bounce off) from the target or other object and hit someone.
8. Use arrows that are the proper length for you. Arrows that are too short can cause serious injury.
9. Never shoot an arrow straight up into the air.
10. Walk; do not run, on the archery range. If you run, you might accidentally cross in front of another group of archers, step on arrows lying on the ground, or fall and trip into a target and be injured by the arrows sticking out of it.
11. When retrieving arrows from behind a target, on a field range or at an isolated target, lean your bow against the face of the target or stick an arrow in the top of the target with the fletching up. This will warn other archers that you are behind the target.
12. Always use proper safety equipment, including an arm guard, a finger tab or glove, quiver and a bow sling if one is on the bow.
13. Always inspect your equipment before shooting. Repair or replace damaged equipment. Replace the bowstring when it becomes worn.
14. Always have an arrow on the string when shooting a bow. Dryfiring (shooting a bow without an arrow) can seriously damage a bow and possibly injure the archer. Never dryfire a bow.
15. Always listen to the Range Master and follow his or her commands.



BOW HUNTER'S CREED

I will:

- Keep a clean and safe camp.
- Put out my campfire.
- Be a safe and cautious hunter.
- Only shoot at game within accurate range.
- Help the novice become a better hunter and sportsman.
- Cooperate with game and forest service officials.
- Abide by and help enforce hunting regulations.
- Use good hunting equipment and keep my broadheads razor-sharp.
- Cooperate with landowners by closing gates and being considerate of their property, and always ask for permission to enter.

Equipment Needed for this Project:

Bows

Bows are made from wood, fiberglass, and metal (aluminum or steel). Selecting the right bow is important. If you select the right equipment, your experience will be more successful and more enjoyable. The first piece of equipment you will select is a bow. The first thing you want to determine is whether you need a left hand or a right-hand bow. There is more involved in this decision than whether you are left or right handed. Just as most of us favor one hand over the other, we also favor one eye over the other. But, there is no correlation between our preferred hand and our preferred eye. Do an eye dominance test to help you determine which eye you favor. Bows are designed to be drawn a standard distance, called a draw length. With longbows and recurves, the farther back you pull the string, the greater force you exert. The amount of force (measured in pounds) it takes to draw a bowstring on a bow is called the draw weight. As a beginner, the most important consideration is the draw weight of the bow. It is very important that you be able to draw the bow fully and hold it for several seconds without undue strain. An archer should be able to hold a full draw for a 7- to 10-second aiming period. Another way to test the draw weight is to pull the bowstring back several times. An archer should be able to pull the bow to full draw 10 or 12 times without noticing muscle fatigue. A bow that is too heavy will prevent you from developing good shooting form. Start with one that is easy to draw and hold.

Weight Guideline

3–6 grades, weight is 15–20 pound bow

7–9 grades, weight is 25–30 pound bow

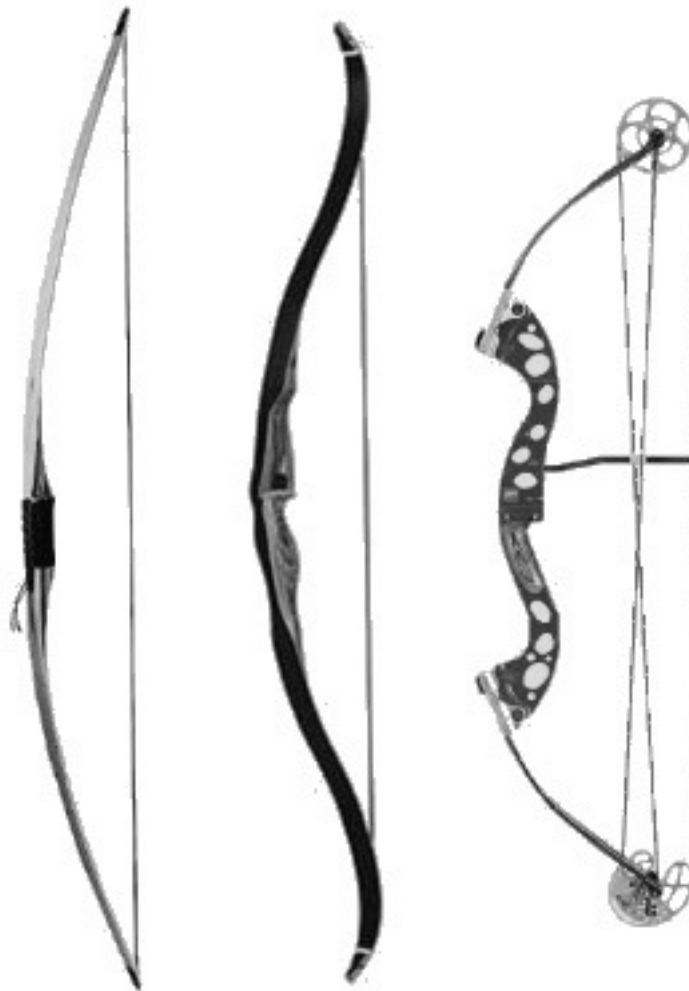
10–12 grades, weight is 35–40 pound bow (or greater)

It is always better to shoot a bow of lesser draw weight than to be overbowed.

An archer should be able to hold a bow at full draw for 7–10 seconds comfortably.

Kinds

- *Straight limb or long bow*—simplest bow made, no gimmicks attached. It has a smooth pull and flat trajectory. Some archers feel it offers steadier, more accurate shooting. English knights used this type of bow.
- *Recurve*—Bows commonly are made of fiberglass or laminated fiberglass and wood. Some have risers made of metal or limbs made from a synthetic material such as graphite. Because of their curved limbs, recurve bows shoot arrows faster than longbows. They often are used in hunting and target shooting. Archers who compete in Olympic events have to use recurve bows. World Archery events allow the use of Recurves and Compounds.
- *Compound*—(2- and 4-wheel) these bows shoot the arrows the fastest and are easiest to hold at full draw. The compound bow “lets off” between 0% to 85% of its “peak” draw weight to its holding weight, so one can have 60 pounds of power, but is actually only holding as little as 10 pounds when aiming, depending on the percentage.

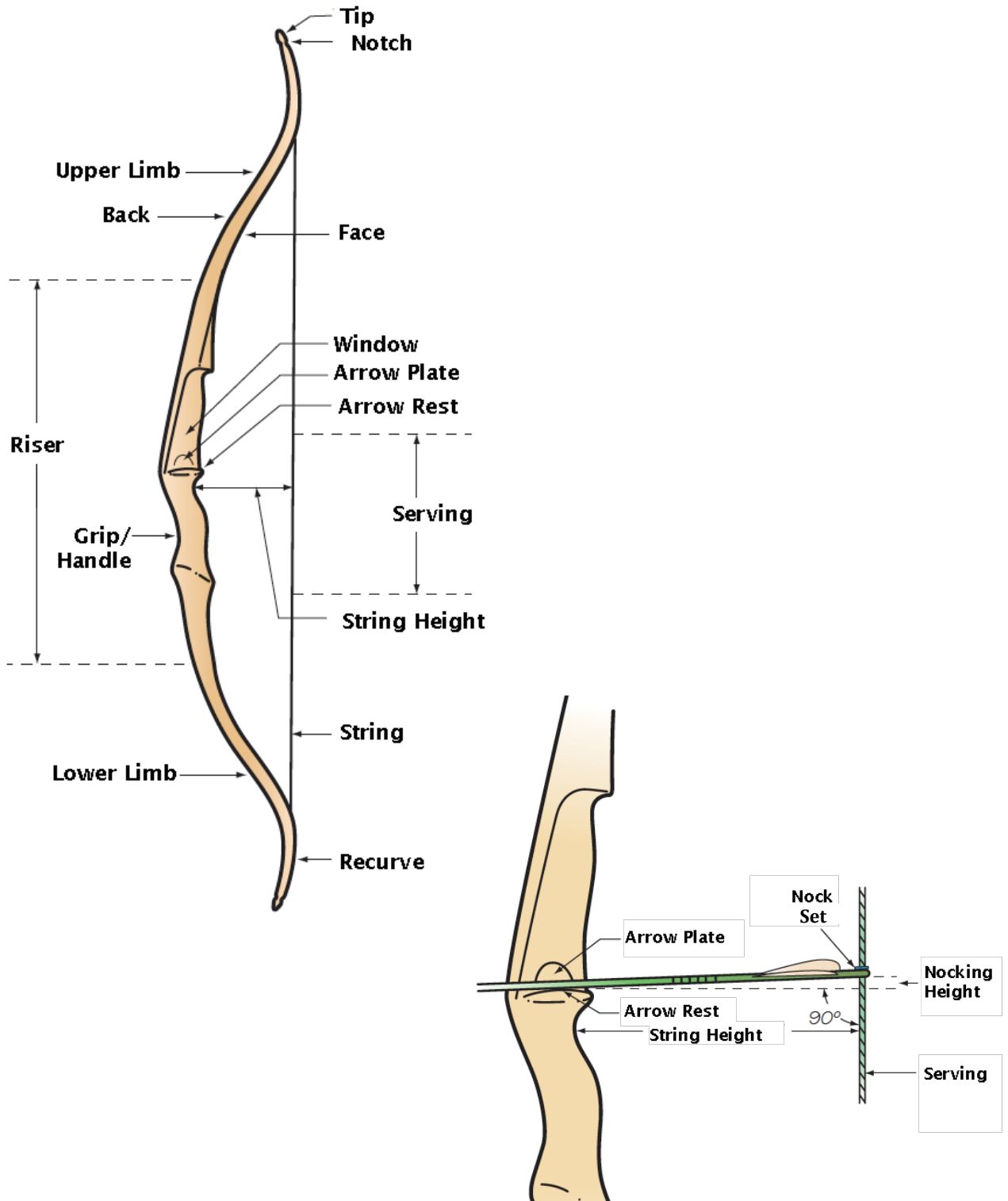


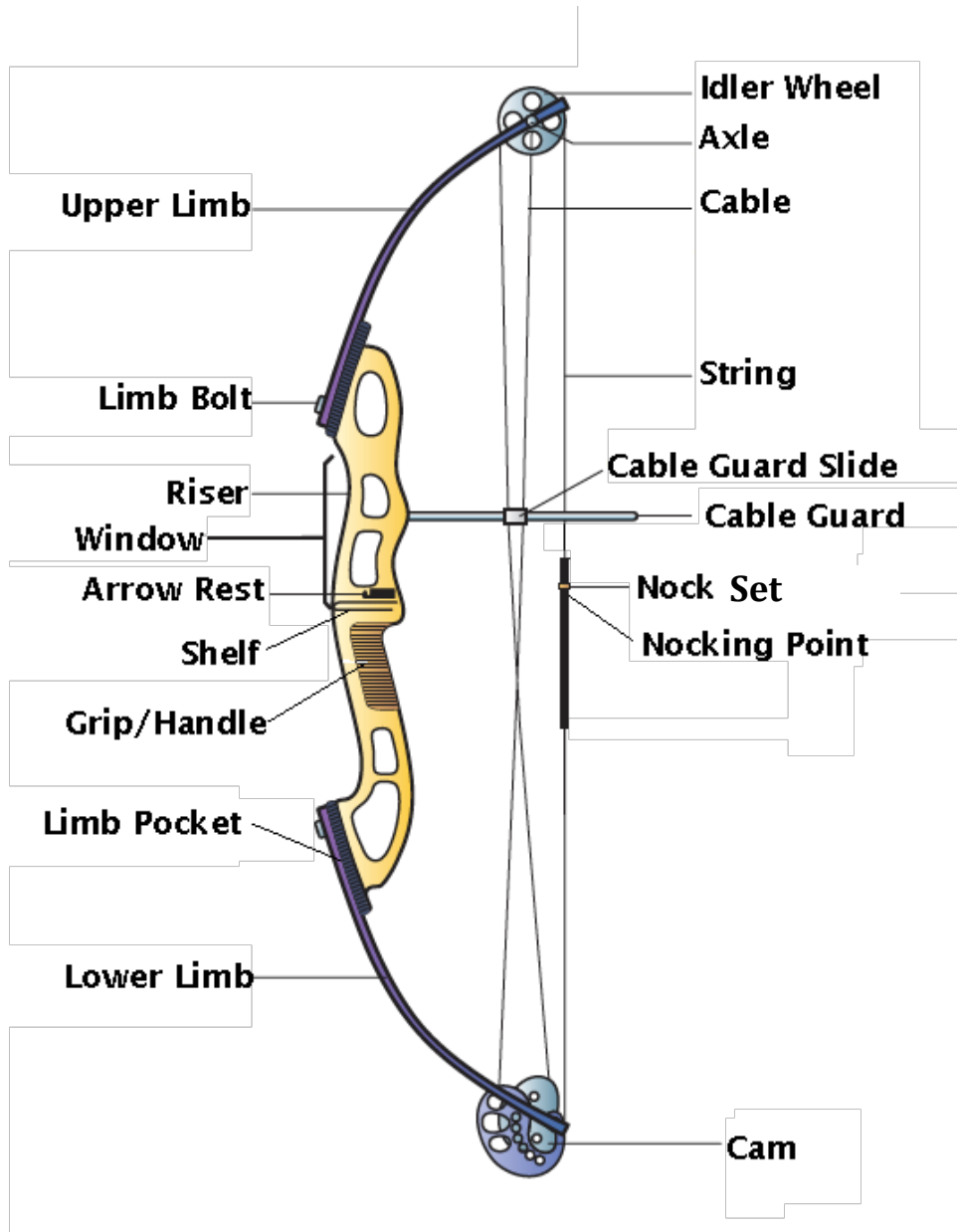
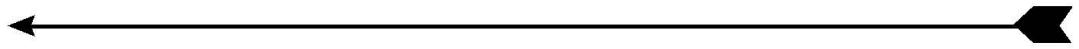
Straight

Recurve

Compound

Parts of the Bow







Target Arrows

Arrow Materials are wood, fiberglass, aluminum, carbon, and composite (aluminum core and wrapped with carbon).

Beginners usually shoot arrows made from aluminum or wood. Arrows must be of suitable length for your draw. At a full draw, at a minimum, the entire point of the arrow should extend just beyond the back of the bow, or one inch beyond the arrow rest. The stiffness of the arrow is called the “spine.” Always use arrows with the proper spine and length for the bow. Arrows come with many different kinds of points, each designed for a different use. Target points usually are conical or bullet shaped, and are designed to cause minimal damage to foam or grass target mats. Field points may be bullet shaped or shaped somewhat like the point of a pencil. They often are used for target practice. Broadheads have two or more cutting edges. Bowhunters use other points such as judo heads and blunts in certain situations.

Wooden arrows

Most wooden arrows are inexpensive. However, with the recent popularity of traditional archery, there are better quality, more expensive arrows available. Wooden arrows may be less durable than arrows made from other materials. They may warp, splinter, and break with heavy use.

Fiberglass arrows

Fiberglass arrows are mainly for bow fishing. They are not recommended for hunting or target shooting because they are too heavy.

Aluminum arrows

Aluminum arrows are available in a range of sizes, prices, and durability. Most are durable with heavy use and can be straightened. Replacing fletching, points, and nocks on aluminum arrows is easy.

Carbon arrows and composites

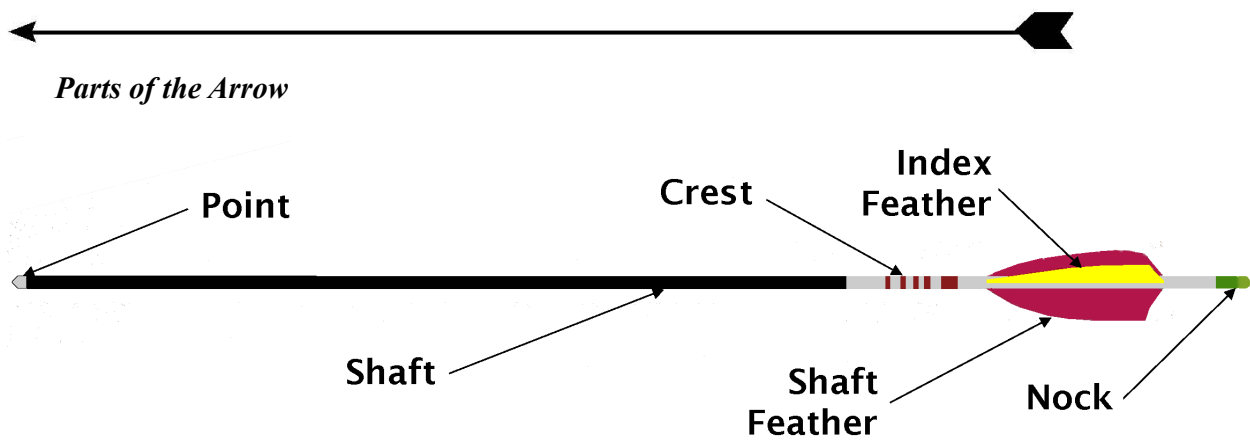
Carbon arrows are for more experienced archers. They are very strong, durable, and lightweight. However, they are expensive. Many compound bow hunters use carbon arrows. They also are becoming popular with dedicated target shooters who use traditional bows.

How To Measure Length

There are three methods of measuring length:

- Stretch both hands out in front of your body with palms together. Measure from tip of fingers to your chest. This is the minimum length of arrows needed.
- Stretch both arms out at shoulder height. Measure total distance between middle finger tips. Divide this length by 2.5. Example: If spread measurement is 57"–59" arrow length should be 22"–24". If 60"–62", arrow length is 24"–25". If 63"–65" arrow length is 25"–26", etc.
- The best way to determine correct arrow length is to draw a special measuring arrow that has been marked every inch, like a ruler. Then when you are at full draw, your correct arrow length is read from the marked arrow, where it crosses the back of your bow, or one inch greater than the distance of the arrow rest.

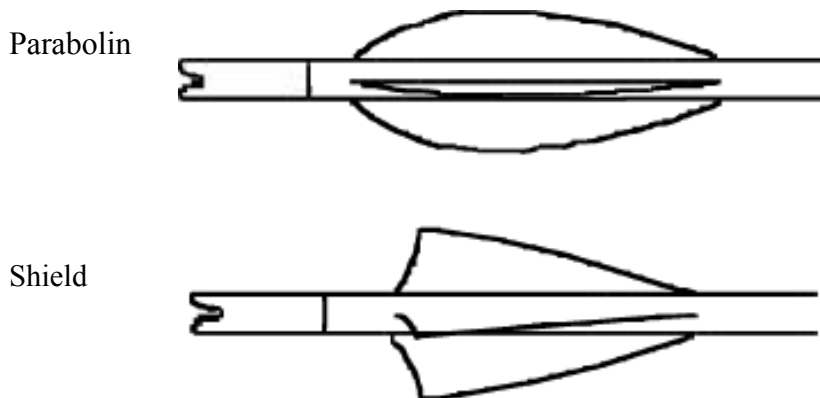
You will need a matched set of arrows (arrows identical in length and spine to each other) for tournament shooting. It is extremely important to have a matched set of arrows. Do not mix and match. Fletching are the guidance system for arrows. Fletching is made of either feathers or plastic vanes. It is available in different sizes and colors. Beginning archers often prefer feathers to vanes because feathers are more forgiving. They can fold or flatten as they pass the bow and arrow rest. You might prefer plastic vanes if you will be shooting in wet weather or using more durable arrows. However, vanes cannot be shot off the shelf. They require an arrow rest that folds out of the way or does not touch the vanes as they pass.



Feather Shapes

The feathers help determine the stability and noise of the arrow while in flight.

The two most used cuts are:



Safety Equipment

Arm guard -- to protect your forearm from the bowstring and a possible broken arrow. It also provides a smooth surface for the string to strike, preventing the improper flight of the arrow.

Finger or Bow Sling -- to prevent the bow from dropping to the ground once an arrow has been shot. Using a finger sling or bow sling helps the archer in achieving a smooth release of the arrow.

Release Aid or Mechanical Release -- keeps the shooting fingers from touching the bow string and helps the archer to deliver a smooth release of the arrow.

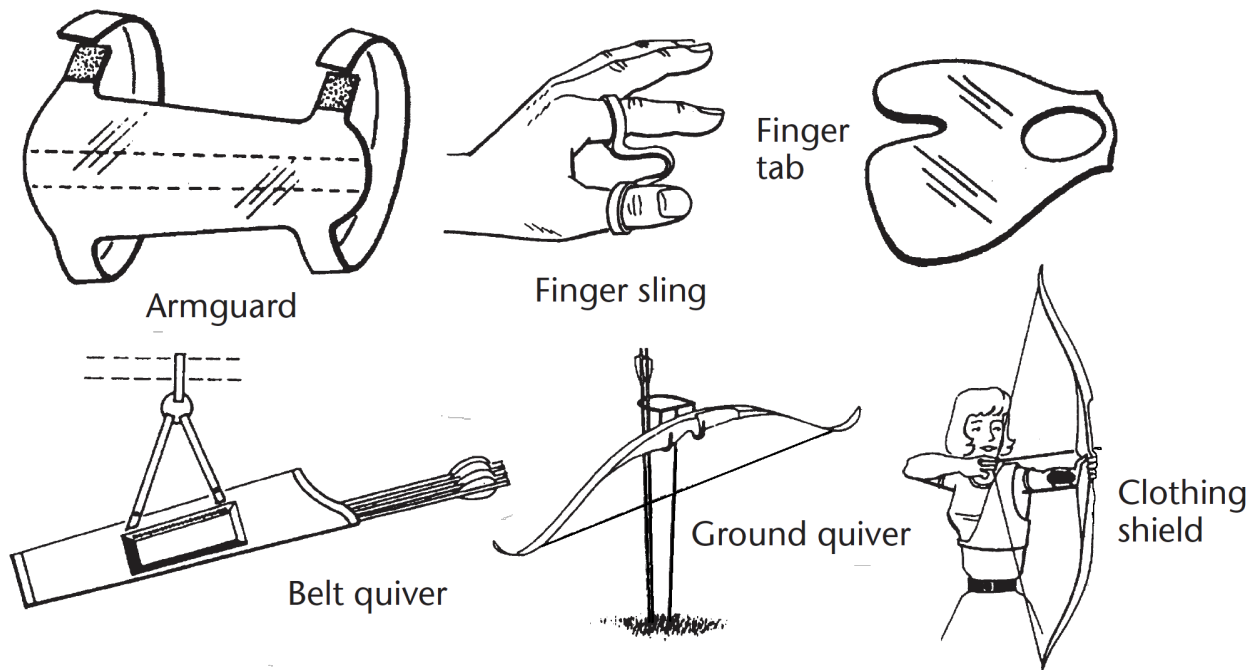
Finger Tab -- to protect the three "shooting" fingers and provide for a smooth release.

Ground Quiver -- to prevent your arrows from getting under your feet while shooting and to hold your bow while retrieving your arrows.

Chest Protector or Clothing Shield -- to protect the upper body from string slap and to help prevent the string from catching on your clothing.

Side Quiver -- to prevent your arrows from getting under your feet while shooting, and to provide a means of carrying arrows from the target back to the shooting line.

The beginning archer needs some accessories to have a successful and positive experience. The most important accessories include an armguard, a finger tab or glove, and a quiver. Always wear an armguard and finger protection when shooting your bow, to protect yourself from injury. Wear the armguard inside your bow arm (the arm with which you hold your bow) between your wrist and your elbow. This keeps clothing out of the path of the string and reduces the chance of injury should the string hit your arm. Beginning archers should wear a finger tab on their string hand (the hand that draws the string). The tab protects the first three fingers, which hook onto the string as you pull it back. Bowhunter archers may switch to a shooting glove or a mechanical release. The quiver holds the arrows. It is a helpful piece of equipment for any archer. Different styles of quivers complement different styles of shooting. Belt quivers attach to your belt on the string side of your body and are popular with target archers. Ground quivers stick into the ground and often feature a rack to hold your bow when you are not shooting. Bowhunters often use a quiver that mounts directly to their bow. As you gain skill, you might want to try some other accessories. A sling worn on the wrist or fingers helps you keep a light grip on the bow. A chest protector or clothing shield is worn on your chest. It helps keep your shirt or jacket away from a fully drawn string. A kisser button attaches to the string at the point where it touches your lips when you are at full draw. This helps you draw the string to the same point for each shot. Stabilizers reduce bow torque. Advanced shooters may install a clicker inside the sight window to signal when they have reached full draw.



Archery in 4-H camp

Objective: To introduce the youth to the sport of archery in a safe environment.

Safety: A certified range instructor is required. One for each twelve archers.

Games: The youth always like to pop balloons and to do balloon art.

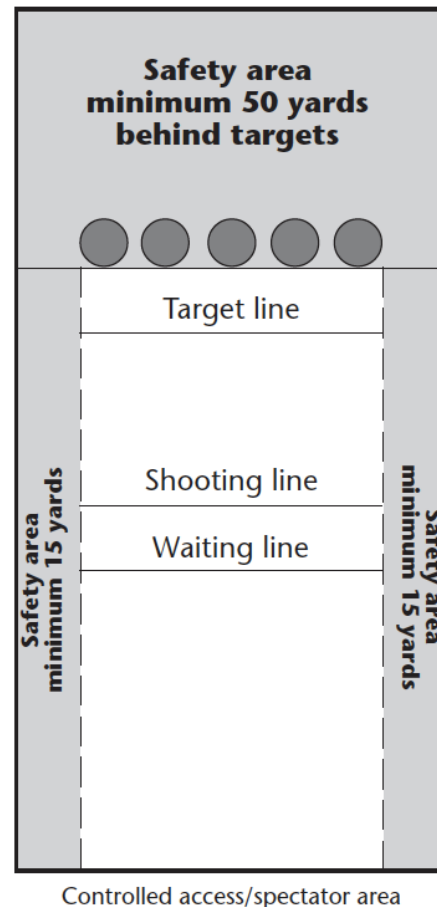
Basic equipment needed: A safe range, bows, arrows, armguards, finger tabs, and bow stringer.

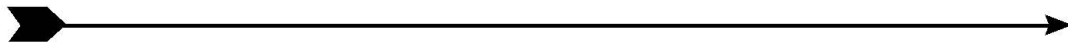
On the Range Safety is first

The place that you will shoot your bow and arrow is called a range. The most important aspect of an archery range is safety. Do not set up targets in front of buildings, sidewalks, or other areas where people might pass. A hillside bank is ideal, or use a back stop netting, but these are not necessary. Remove brush and obstacles from behind targets as much as possible. This helps avoid lost and broken arrows. It also prevents arrows from deflecting, so you can find them more easily. You might need to find out if your city has an ordinance about shooting within the city limits. The shooting range should be defined by clear perimeter lines. These lines can be made of tape, lime, or rope. If you are shooting indoors, make sure that there are no doors that could allow people to walk into your range. Post warning signs around the perimeter of the range to help ensure that spectators and nonparticipants stay out of the area.

Parts of a range

A range should have a shooting line, a waiting line, and a target line. These can be made with tape or lime. The shooting line is the line that the shooter straddles to fire his or her arrows. With beginning archers, this line needs to be close enough to the target so that the archer will be successful and hit the target every time. The waiting line should be 3 yards behind the shooting line. Shooters are required to stand behind the waiting line until it is safe to retrieve their arrows, and until the range commander allows them to advance to the target line. Waiting behind the waiting line gives all other shooters an opportunity to concentrate fully on each shot. When it is time to retrieve arrows, and the range commander has given the signal, you may approach the target line. The target line should be 5 feet in front of the target. This line acts as a “speed bump” and slows the people walking forward to pull their arrows so they won’t run into the arrows sticking out of the targets. It also keeps the people that are waiting to pull their arrows a safe distance from the targets. As you begin to shoot, you will want to practice shooting into target butts with target faces attached. Make sure your target is attached securely to the butt. Target butts need to be approximately 4 feet square. This size allows more arrows to hit the targets. Targets are made of foam or natural materials such as straw bales, tightly wound grass, or excelsior bales. Youth begin shooting from a distance of approximately 5 to 10 yards. As your skills improve, increase this distance in 2 - 5 yard increments. You will shoot with your club at a range, but you may want to set up a target at home to practice. If you are going to do this, make sure that you have plenty of room.





Retrieving arrows

When the range commander signals, archers may approach the target line. One archer per target may go forward to retrieve her or his arrows. Walk forward slowly, watching for arrows that fell short or bounced out of the target. Retrieve these arrows as you come to them. Be very careful when pulling the arrows. Be sure no one is standing behind you. Stand to the side of the target, and place one hand on the target face next to the arrow. Press the target against the butt and grab the arrow as close to the target as possible (touching the hand on the target face). Pull the arrow straight out. Place this arrow in the quiver before you pull out the next.

Care for a Recurve Bow or Longbow

Always unstring your bow when you are not using it. This will lengthen the bow's life and keep it from taking on a permanent bend. Store the unstrung bow in a cool, dry place, hanging it vertically or horizontally on pegs. An occasional coat of furniture wax will help protect the finish. Never use your bow as a walking stick or allow it to strike objects that will nick or scar it. Scratches can turn into splinters and eventually result in a broken bow. When a bow might be exposed to rain or possible damage, place it in a bow case, a long narrow sack made of soft material. A bow is a delicate instrument. With proper care, it will last for many years.

Care for a Compound Bow

A compound bow requires constant care. Because it is a highly technical piece of machinery, any adjustments must be done by a bowyer trained to work on compound bows. The user's manual included with the bow will give you detailed care instructions. The manual will tell you whether and when to lubricate the axles, whether and when to replace the cables and string, and how to store your bow. Follow the manufacturer's instructions carefully and your bow will give good service over many years.

Care for Strings and Cables on bows

Keep your bowstring and nonmetal cables well-waxed with a commercial-bowstring wax. Inspect the string carefully before and after each day's shooting. If the string is frayed, check the string carefully for broken strands. If any of the strands are broken, replace the string. If no strands are broken, give the string a good coat of wax to help prevent further fraying. Check the serving and repair or replace it if it is loose or worn. The serving protects the delicate fibers of the strands from directly contacting the arrow nock and assures longer string life.

The STEPS TO SHOOTING

Archers must follow the Steps to Shooting to achieve a smooth release of the arrow. Before you release, run a quick mental check of all the other steps. If everything is right, release, and you will see your arrow strike the mark.

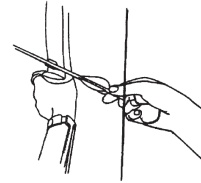
1) Stance & Posture

- a) Place one foot on each side of shooting line.
- b) Find a comfortable balanced stance with feet shoulder width apart.
- c) Stand straight, keeping ribs and chest down, and bottom tucked under. Keep shoulders down and relaxed.



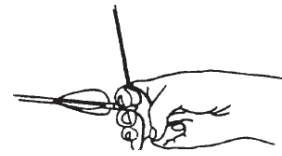
2) Nock Arrow

- a) Place arrow on arrow rest, holding arrow close to nock.
- b) Keep index fletching pointing away from bow.
- c) Snap nock of arrow onto bowstring at nocking point.



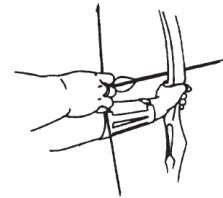
3) Set Hook

- a) Set first groove of first three fingers around the bowstring under the arrow nock creating a hook.
- b) Keep back of drawing hand flat and relaxed.
- c) The thumb and pinky should be tucked away.



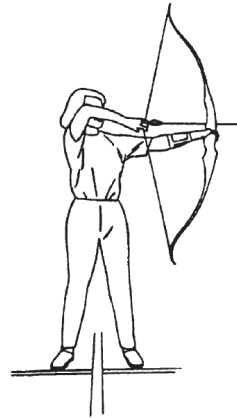
4) Set Bow-Hand Grip

- a) Position the bow-hand on the bow grip by making a Y with the fingers and thumb.
- b) The knuckles of the fingers should be positioned at a 45 degree angle and the thumb pointed towards the target.



5) Raise & Extend Bow

- a) Raise bow arm and string hand together towards the target, while keeping shoulder down and aligning chest perpendicular to target.
- b) Drawing arm should be near level of nose.
- c) Bow arm should be rotated so it is straight up and down.



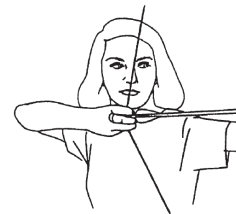
6) Draw

- a) Draw the string back in a straight line from raising and extending bow (step 5) to the side of the face anchor point.
- b) Set drawing arm shoulder back and down until elbow is directly behind or a bit higher than arrow.



7) Anchor

- a) Draw string to side of face placing tip of first finger on corner of mouth.
- b) Keep hand snug against face folding thumb down and little finger towards palm.



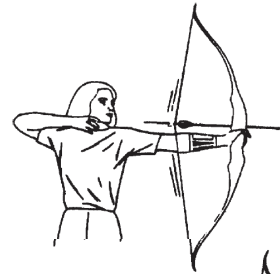
8) Aim

- a) Look at target or through sight, keeping focus on form.
- b) Focus on the point of aim if not using sight.
- c) If using sight then focus on the point you want to hit.
- d) Keep string lined up with center of bow.



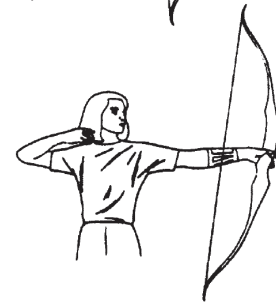
9) Release

- a) Release all tension in fingers and drawing hand, all at once, while continuing to draw bowstring back without stopping.
- b) Continue bow arm towards target.
- c) Continue focusing on target.



10) Follow Through

- a) The drawing hand should continue back beside neck with fingers relaxed and ending up behind the ear.
- b) Keep bow arm up.
- c) Maintain follow through until arrow hits target.



11) Relax & Evaluate

- a) Relax after each shot.
- b) Evaluate the feeling of each shot to determine if you accomplished the goal you were trying to achieve.
- c) If not, you should refocus your efforts on the feeling of the proper shot and try again.



Developing Proper Archery Shooting Form

Successful archery shooting is easy, but people tend to make it hard. Intense concentration and good muscular development are essential. The ability to remain relaxed is also very important. To most people the combination of intense concentration and relaxation seems impossible. Like the archer's paradox where the arrow must bend in order to fly straight, both concentration and relaxation are necessary for top performance.

Like other types of shooting with single projectiles, archery requires that the archer be relaxed and comfortable. Since concentration on the sight or the target is critical to success, the tasks required to fire a shot must be practiced until they can be done without conscious effort. Once they become routine, the mind is free to focus on hitting the mark. This process involves the archer developing consistent form from shot to shot. As the consistency in form improves, consistency in shot placement improves. By focusing on the elements of good form we will make consistently good shooting easier to develop. Some steps will feel strange or even uncomfortable at first. However, they have been proven successful over many years by archers from all over the world.

No matter what kind of archery you select, the basics of proper shooting form are the same. By developing sound, consistent form early in your shooting development, you can reach higher levels of achievement in the chosen sport.

Archery Basics

Only a few steps are required to shoot an arrow successfully. You must take a proper stance, grip the bow properly, nock an arrow, grip the string properly, raise and extend the bow arm to shooting position, draw, anchor, aim, release, follow through, and relax and evaluate. That seems simple enough, but the mind cannot cope with that many things all at once. These steps must become established, well-practiced habits. Once you have a fixed shooting routine and good shooting form, the mind can be set free to concentrate on the target or the sight pin for more precise shooting.

The STEPS TO SHOOTING explained

Stance & Posture

A good shooting stance involves a relaxed, erect posture. The feet should be straddling the shooting line, shoulder-width apart. A line drawn across the tips of the toes should point to the center of the target. Some people find that moving the bow-hand foot back a few centimeters (up to about 6 inches) is more comfortable, but that may cause some problems in keeping the rest of the body in line. It forces muscles to work, increasing the potential for fatigue and inconsistency. Lines drawn through the hips and through the shoulders should also point to the center of the target. The head should be erect, relaxed and rotated toward the bow-hand side.

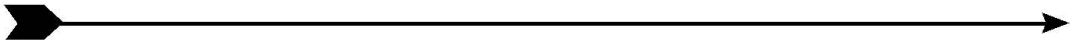
Pick a point as a target, establish an imaginary shooting line and try getting into this stance with your partner's assistance. Once you are comfortable, switch roles, repeating the exercise until both of you feel comfortable.

Nock Arrow

You will learn two ways to nock an arrow. The first is only for learning ease. The second is for accepted target shooting etiquette. We will practice both styles without placing the arrow on the string. Be sure you are standing at least 2 to 3 meters (6 to 10 feet) away from other groups and that the arrows are never pointed toward another person. Rotate the upper limb of the bow toward the string hand so that the sight window is up. Using the sight window as a shelf, slide an arrow forward. Rotate the arrow until the index vane is up (facing away from the sight window). Draw the arrow back to the string. Although we will not actually nock the arrow now, the nock is positioned below the single nocking point indicator (toward the lower limb tip) on the middle serving. Some archers prefer to use two nocking points, placing the arrow on the string between them. Try this several times with each partner. Next, hold the bow almost vertical, canted slightly toward the string hand. Rotate the string slightly (just enough to allow hand to clear it) toward the string hand side. Grasp an arrow near the fletching and reach forward, placing it on the arrow rest. With the arrow on the rest, draw the nock back to the string. Again, be sure the index vane or feather is positioned away from the sight window. The tip of the arrow should be pointed down range during the entire nocking process.

Set Hook

The string hand uses hooked fingertips to draw the string and the arrow into position for a shot. The back of the hand should remain flat throughout the drawing and shooting sequence. An easy way to ensure that is to use a three-fingered salute. Hold the hand upright, palm forward. Bring the little finger of the drawing hand toward the center of the palm and hold in place with the tip of the thumb. That keeps the hand flat. Next, bend the remaining three fingers into a hook. This approach is used with either a tab or a shooting glove. The fingers may be placed on the string several ways. The most commonly



used approach is to place the index finger above the arrow and the nocking point indicator and the remaining two fingers below it (split-fingered or Turkish draw). Another common approach is to place all three fingers under the nock (Apache draw). It is very effective for short range shooting. In either case, the fingers are placed on the string at about the last joint of the fingers. A slightly deeper grip, almost to the second joint, is quite acceptable when using a tab. Tabs give more consistent results than gloves with most archers. The problem known as "finger pinch," where the arrow lifts away from the rest, is commonly caused by curling the hand during the draw. It can be cured by taking a slightly deeper grip on the string (almost to the second joint) and/or by folding the little finger and the thumb into the palm of the drawing hand. Three fingers under the arrow helps prevent finger pinch and is the easiest for a beginner.

Set Bow-hand Grip

Two types of grips are used by the majority of archers. Both of them are relaxed, allowing the bow to move freely on the release. For those of you who are afraid of dropping the bow, either use a sling or lightly touch the tip of the thumb to the tip of your index finger. The grips share several common elements. Both are begun as if extending the hand in a handshake. The hand is held vertically, and the bow fits into the U-shaped opening between the thumb and the fingers. The wrist remains in direct alignment with the forearm. The elbow is rotated out, so that the forearm can move readily toward the center of the chest when the elbow is flexed. A high-wrist grip allows the bow's handle to seat only in the web between the thumb and the forefinger. In this grip the wrist remains straight, aligned with the forearm both horizontally and vertically. The low-wrist grip allows the muscles controlling the hand to relax. This causes the hand to rise above the forearm and the bow handle to seat against the palm of the hand. This grip is similar to having a completely bedded rifle barrel. Like that situation, perfect and consistent bedding of the bow's grip gives very consistent shooting performance. Slight changes from shot to shot, however, produce changes in the point of impact. On the other hand, the high-wrist grip is similar to using a free floated rifle barrel. The only point of contact is well established, and the bow does its own seating in the hand. Most target archers use a low wrist because they get better performance with it. Many hunting archers use a high wrist because it is less sensitive to slight differences in hand position or pressure. Try both of them with your partner, drawing the bow only one inch.

Raise & Extend Bow

Once the stance and hand positions are established with a nocked arrow, the entire unit is brought into shooting position at the same time. Start with the bow arm extended about 15 degrees from the body and on a line toward the target. The forearm of the string hand should be set on the string. Moving the arms from the shoulders, fully extended and pointing at the target. The forearm of the string hand should be brought back to form a slight draw. The string hand elbow should be raised straight up as the bow is raised.

Draw

Pull the string back toward the anchor point. The bow is drawn back using muscles of the back. The draw should be a smooth motion, keeping the forearm in line with the arrow shaft.

Anchor

High-anchor point (barebow): Most archers anchor the tip of the index finger against the corner of the mouth or the canine (eye) tooth on the dominant side. Often a secondary anchor point is used. The thumb may be placed along the angle of the jaw or behind the ear, or it may be nestled against the back of the jaw bone. Since the anchor point establishes the location of the "rear sight" even for instinctive archers, it is essential that the anchor point be consistent.

Low anchor point (freestyle): Most archers anchor under the center of the chin or off to the draw arm side, and place the tip of the nose on the string. Kissers buttons are also used to help find the same anchor point each time.

Aim

In instinctive archery, aiming is simply an intense concentration on the target. Pick a tiny spot and concentrate all your attention on it. As in rifle shooting, releasing before you are satisfied with the hold or waiting too long during the aiming phase will lead to large groups and inaccurate shooting. Experienced instinctive archers pause briefly, perhaps a second or two, to be sure of their hold before releasing the string. Although this is not a true sight picture, the archer does form a mental image of the proper relationship between the bow and the target. Throughout the aiming sequence, the string hand should remain firmly locked to the anchor point. Try coming to an anchor point without equipment right now.



Release

A proper release is achieved by simply relaxing the fingers of the drawing hand while pulling the string-hand elbow back slightly with the back muscles. To feel a live release, hook the fingers of one hand into the hooked fingers of the other hand. Holding the hands across the center of your chest, pull with both hands. Note that this requires you to use your back muscles, just as in drawing a bow. Relax the fingers of the drawing hand. The elbows rotate back quickly for a few centimeters (inches). This is exactly what should happen in a live release. The fingers of the shooting hand should flow along the side of the face. The bow should rock forward at the same time. Your partner will be watching for a live release by observing the position of your hands during the follow through.

Follow Through

A proper follow through is essential to consistent, accurate shooting with all types of equipment. Archers must pay particular attention to follow through. The bow arm and string arm should maintain their positions until the arrow is in the target. Fatigue is the prime factor in improper follow through.

Relax & Evaluate

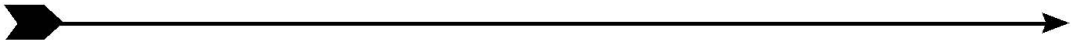
Relax after each shot. Evaluate the feeling of each shot to determine if you accomplished the goal you were trying to achieve. If not, you should refocus your efforts on the feeling of proper shot and try again.

Common Faults and How to Fix Them

It can be difficult to determine why arrows are landing where they are. Watching where arrows land on the target face can help you identify shooting form errors. Archers with good and consistent shooting form should shoot their arrows in a group. A group is when the arrows are all close together, even if the group is not in the center. Here are some arrow patterns and common errors that cause the patterns.

Common Faults and How to Fix Them

Pattern	Possible reasons	How to correct
High arrows	Arrow nocked low.	• Check the nocking point frequently. • Be sure the nocking point is perpendicular to the arrow shelf so that the arrow, when nocked, is perpendicular to the string.
	Pulling drawstring back too far.	• Maintain a consistent anchor point.
	Raising the bow arm during the release.	• Concentrate on form.
		• Look right down the arrow at the target.
	Pulling the hand down during release.	• Maintain follow through until the arrow hits the target.
Low arrows		• Lightly grip the bow, allowing it to rock forward naturally when you release it.
	Dropping the bow arm during release.	• Maintain follow through until the arrow hits the target.
		• Lightly grip the bow, allowing it to rock forward naturally when you release it.
		• Keep the bow arm at the same height as at full draw.
	Collapsing. (Bow arm moves to the right, string hand moves out or forward.)	• Continue pulling.
	• Maintain a consistent anchor point.	

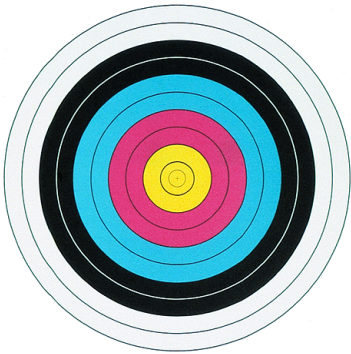


Pattern	Possible reasons	How to correct
Low arrows continued	Creeping. (Reversing the drawing motion, or allowing the arrow to move forward before release.)	• Continue pulling through with one motion all the way through the release.
	Leaning towards the target.	• Stand up straight.
	Arrow placed on shelf instead of rest.	• Place arrow on the rest.
Left and right arrow patterns	Canting the bow. (Tilting the bow to the right or to the left.)	• Keep the bow straight up and down.
	Peeking. (Pulling your face around the bow to get a better look at the target when shooting.)	• Focus on the target.
		• Maintain your follow through until the arrow hits the target.
	Gripping the bow too tightly.	• Keep your bow hand relaxed throughout the shot..
		• Place only your thumb and forefinger around the bow.
Left arrows (Right for left-handed shooters)	Plucking. (Pulling the release hand away from the face during release.)	• Continue to draw the bowstring as you relax your fingers.
		• Keep your hand close to your face.
	Flinching with the left arm.	• Adjust armguard to remove the fear of string slap.
Extremely left arrows (Right for left-handed shooters)	Aiming with the left eye for a right eye shooter or vice-versa.	• Perform the eye dominance test and trust it.
		• Put a piece of scotch tape over one lens of a pair of shooting glasses to make you use your dominant eye.
Low left arrows (Low right for left-handed shooters)	String hitting the chest or bow arm, or being caught by loose clothing.	• Open your stance slightly.
		• Wear your armguard tightly over clothing.
		• Dress appropriately, with no loose clothing.

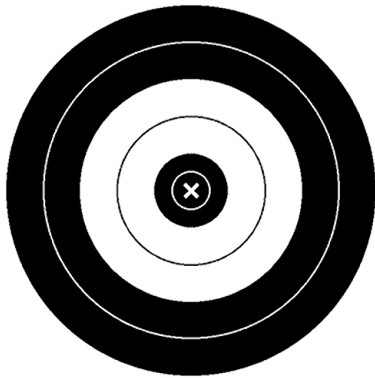
These faults are common and may be corrected easily. Remember that the most important factor in successful shooting is good, consistent form. Practice your form and follow through, and you will have won more than half of the battle.

Target faces and how to score them

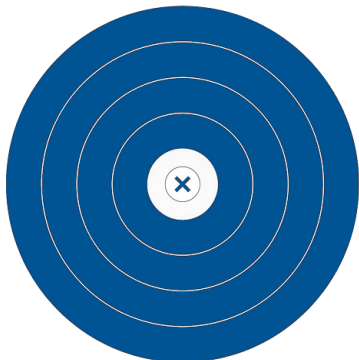
The most common types of faces are FITA multiple color 10 ring, NFFA Field black and white, NFFA Blue face, and NFFA Animal. All targets are scored from the center out. Record the arrows closest to the center first and then out on the score sheet. If the arrow touches the line it receives the higher score. The way the X's are used varies from tournament to tournament. Example: in the Olympics, the 10's are counted first, and if it is still a tie, then the X's are counted.



FITA is scored, X, 10, 9, 8, 7, 6, 5, 4, 3, 2, 1, M. X receives 10 points and M receives 0 points. The X is used as a tie breaker. In FITA the tie break is done by counting the 10's first then the X's, 9's, 8's, and so forth.



Field is scored, X, 5, 4, 3, M. X receives 5 points and M receives 0 points. The X is used as a tie breaker.



Blue Face is scored, X, 5, 4, 3, 2, 1, M. X receives 5 points and M receives 0 points. The X is used as a tie breaker.



Animal is scored, 10, 8, 5, M. M receives 0 points.
10 is the center or heart of the animal.
8 is the vitals of the animal.
5 is the outline of the animal.
M is the antlers, hoofs or missing the animal.



PUBLIC PRESENTATIONS (DEMONSTRATIONS)

A public presentation is showing and telling how to do something. You will learn many things in your 4-H Archery Project that you can share with others through different kinds of demonstrations. Check with your county 4-H presentation committee to verify the use of archery equipment during your presentation. Public presentations may be given individually or with a teammate. Here are some good ideas for public presentations:

- How to string a bow.
- How to stand when shooting.
- How to nock, draw, and release an arrow.
- How to aim with a bow and arrow.
- How to draw arrows from a target.
- How to score an archery match.
- How to select a bow.
- How to select arrows.
- How to store, carry, and care for a bow and arrows.
- Developing your archery muscles.
- The science of the sport.
- Path of a projectile.
- Making a quiver.
- Good sportsmanship. What it is how and how to demonstrate it.
- Demonstrate how shooting sports relates to the four H's of 4-H Pledge.
- Robin Hood's influence on archery.

EXHIBITS AND DISPLAYS

Your club may be invited to prepare a window display, educational poster or an exhibit for a 4-H Achievement program or your community or county fair, regional or state fair. You might include posters showing the history of archery, safety, shooting techniques, wildlife conservation, pictures, and equipment.

Make the exhibit, poster and or display educational. It needs to convey the message in a moment and be understood from a minimum of 10 feet away. Check your fair premium book for the size and number of posters a 4-H member may enter.

An archery display should visually explain some technique or process related to archery, such as:

- Why the weight and spine of an arrow must be matched to the weight and cast of the bow.
- The use of aiming points in relation to trajectory.
- The history of archery and its importance to the development of civilization.
- How to fletch an arrow.
- How to make a bowstring.
- How to determine the length of arrows needed by an archer.
- How the bow has developed through the ages.
- Scoring a target.
- Archery in anime.
- Physics of archery.
- Archery games.

4-H ARCHERY ADVANCEMENT PROGRAM

The 4-H Archery Advancement program will:

- Help you learn more about archery.
- Help you improve your shooting skill and score.
- Give you credit for extra work done.
- Allow you to advance at your own pace.

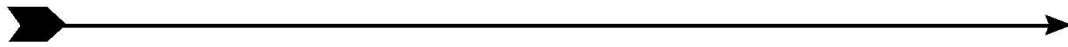
Your progress in the Advancement Program will become a part of your 4-H Record Book. As you complete each requirement, fill in the date and have your Teen Leader, Parent or Leader initial it. When you have completed the required jobs for each step, you will receive a 4-H Archery Advancement certificate. Study each requirement carefully and do your work well. Good luck!

4-H Junior Bowman

<i>Step 1</i>	Date Approved	Passed by
1. Draw a diagram of an arrow and label the following parts: point shaft, crest, fletching, index fletching, and nock.	_____	_____
2. Draw a diagram of a strung bow and label the following parts: tip, string notch, back, face or belly, handle, arrow rest, bowstring, serving and nocking point.	_____	_____
3. Define, describe, and/or explain the purpose or use of these archery terms: arm guard, index fletching, crest, draw, nock (arrow nock, and to nock an arrow), overbowed, overdraw, petticoat, quiver.	_____	_____
4. Learn and practice the "General Archery Safety Rules."	_____	_____
5. Demonstrate (show and tell) how to string a bow.	_____	_____
6. Demonstrate how to nock, draw, and release an arrow safely.	_____	_____
7. Shoot 30 arrows at 9 meters and record your score. Recurves and Bare bow use 60-cm 10-ring target. Compounds use 40 cm 10-ring target. Score at least 130 Bare Bow, or 150 Recurve Free Style and Compound. Score: _____	_____	_____

_____ has completed all requirements and is approved for advancement to the rank of 4-H Junior Bowman.

Approved by _____ Date _____



4-H Bowman

Step 2

Date Approved Passed by

1.	Be a qualified 4-H Junior Bowman and continue to observe the “General Archery Safety Rules.”	_____	_____
2.	Define, describe, and/or explain the purpose or use of the following archery terms: anchoring, arrow rest, barebow, blunt, cast, creep, end, field arrow, freestyle, recurve bow, compound bow, spine, stance, vane, weight (bow weight, arrow weight).	_____	_____
3.	Read a book, story, or article about archery, bow hunting, or wildlife, and report to your club. Tell what happened in the story and what you learned about archery, sportsmanship, and wildlife.	_____	_____
4.	Explain and demonstrate “bow sighting” or “point of aim” sighting.	_____	_____
5.	Explain the proper care and storage of the bow, bowstring, and arrows.	_____	_____
6.	Complete one elective from each group of 4-H Archery Electives, starting on page 28. <u>A</u> __, <u>O</u> __, <u>P</u> __, <u>W</u> __, <u>S</u> __, <u>H</u> __.	_____	_____
7.	Shoot 30 arrows at 9 meters and record your score. Recurves and Bare bow use 60-cm 10-ring target. Compounds use 40 cm 10-ring target. Score at least 180 Bare Bow, or 200 Recurve Free Style and Compound. Score: _____	_____	_____

_____ has completed all requirements and is approved for advancement to the rank of 4-H Bowman.

Approved by _____ Date _____

4-H Junior Archer

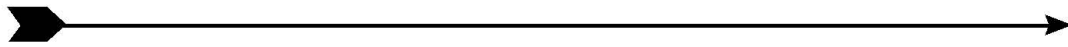
Step 3

Date Approved _____ Passed by _____

- | | | | |
|----|---|-------|-------|
| 1. | Be a qualified 4-H Bowman and continue to observe the “General Archery Safety Rules.” | _____ | _____ |
| 2. | Define, describe, and/or explain the purpose or use of these archery terms: bow sight, broad head, clout shooting, flight arrow, flight shooting, overstrung and understrung, range finder, trajectory. | _____ | _____ |
| 3. | Explain the “Steps of shooting” and why they are important. Demonstrate all the steps | _____ | _____ |
| 4. | Learn the advantages and disadvantages of the flight, field, hunting, fishing, flu-flu, and target arrows. Explain why arrows are made from different materials, fiberglass, carbon, aluminum, and wood. | _____ | _____ |
| 5. | Explain how a compound bow functions | _____ | _____ |
| 6. | Do two electives from each group of 4-H Archery Electives, starting on page 28. <u>A</u> ____, <u>O</u> ____, <u>P</u> ____, <u>W</u> ____, <u>S</u> ____, <u>H</u> ____, <u>A</u> ____, <u>O</u> ____, <u>P</u> ____, <u>W</u> ____, <u>S</u> ____, <u>H</u> ____. | _____ | _____ |
| 7. | Shoot 30 arrows at 18 meters and record your score. Recurves and Bare bow use 60-cm 10-ring target. Compounds use 40 cm 10-ring target. Score at least 130 Bare Bow, or 150 Recurve Free Style and Compound. Score: _____ | _____ | _____ |

_____ has completed all requirements and is approved for advancement to the rank of 4-H Junior Archer.

Approved by _____ Date _____



4-H Archer

Step 4

Date Approved Passed by

1.	Be a qualified 4-H Junior Archer and continue to observe the "General Archery Safety Rules."	_____	_____
2.	Define, describe, and/or explain the purpose or use of these archery terms: pile, quartering wind, barbs, grouping, roving, self-bow, and end loop.	_____	_____
3.	Do a Public Presentation on Archery at a 4-H event	_____	_____
4.	Learn the advantages and disadvantages of the long, reflex, recurve, and compound bows.	_____	_____
5.	Help plan, conduct, and score an archery match between two clubs or teams or a tournament for individuals.	_____	_____
6.	Participate in a tournament and demonstrate good sportsmanship.	_____	_____
7.	Do two electives from each group of 4-H Archery Electives, starting on page 28. <u>A</u> , <u>O</u> , <u>P</u> , <u>W</u> , <u>S</u> , <u>H</u> , <u>A</u> , <u>O</u> , <u>P</u> , <u>W</u> , <u>S</u> , <u>H</u> .	_____	_____
8.	Shoot 30 arrows at 18 meters and record your score. Recurves and Bare bow use 60-cm 10-ring target. Compounds use 40 cm 10-ring target. Score at least 180 Bare Bow, or 200 Recurve Free Style and Compound. Score: _____	_____	_____

_____ has completed all requirements and is approved for advancement to the rank of 4-H Archer.

Approved by _____ Date _____

4-H Master Archer

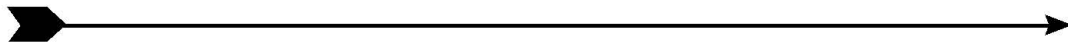
Step 5

Date Approved Passed by

1.	Be a qualified 4-H Archer and continue to observe the "General Archery Safety Rules."	_____	_____
2.	Define, describe, and/or explain the purpose or use of these archery terms: creep, cant, clout, brace, windage, drift, and point blank.	_____	_____
3.	Shoot and list scores for the following tournament rounds. Each round must be shot without a break, except for a brief rest if needed. Junior Easton Round (FITA)(600) _____ Freeman Round (NFAA)(300) _____ Field Round (NFAA)(560) _____ Indoor Round (NFAA)(300) _____ Junior 900 Round (FITA)(900) _____	_____	_____
4.	Serve as a teen leader and help others in the club learn and enjoy archery.	_____	_____
5.	Demonstrate and explain "Instinctive Shooting" and why one would shoot this way.	_____	_____
6.	Participate in a 4-H State Archery Tournament and demonstrate good sportsmanship	_____	_____
7.	Do two electives from each group of 4-H Archery Electives, starting on page 28. <u>A</u> , <u>O</u> , <u>P</u> , <u>W</u> , <u>S</u> , <u>H</u> , <u>A</u> , <u>O</u> , <u>P</u> , <u>W</u> , <u>S</u> , <u>H</u> .	_____	_____
8.	Shoot 30 arrows at 18 meters and record your score. Recurves and Bare bow use 60-cm 10-ring target. Compounds use 40 cm 10-ring target. Score at least 230 Bare Bow, or 250 Recurve Free Style and Compound. Score: _____	_____	_____

_____ has completed all requirements and is approved for advancement to the rank of 4-H Master Archer.

Approved by _____ Date _____



4-H Bow Hunter

Step 6

	Date Approved	Passed by
1. Be a qualified 4-H Master Archer and continue to observe the "General Archery Safety Rules."	_____	_____
2. Learn what special precautions and preparations a bow hunter makes concerning dress, equipment, stalking game, and the procedure after hitting an animal.	_____	_____
3. Learn the state regulations for hunting with a bow and arrow (available from Washington State Game Commission). Complete a Hunters Safety class before going bow hunting.	_____	_____
4. Read about and/or observe some game animal, bird, or fish and report to your club.	_____	_____
5. Know vital target areas for killing animals with an arrow.	_____	_____
6. Learn and practice the "Bow Hunter's Creed."	_____	_____
7. Go bow hunting for game or unprotected animal, bird, or fish with your bow and arrows.	_____	_____
8. Do two electives from each group of 4-H Archery Electives, starting on page 28. <u>A</u> , <u>O</u> , <u>P</u> , <u>W</u> , <u>S</u> , <u>H</u> , <u>A</u> , <u>O</u> , <u>P</u> , <u>W</u> , <u>S</u> , <u>H</u> .	_____	_____

_____ has completed all requirements and is approved for advancement to the rank of 4-H Bow Hunter.

Approved by _____ Date _____



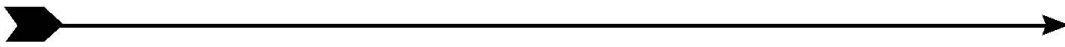
4-H Archery Electives

Electives *Archery* (*Make a notation of which one is used for each level*)

1. Read a story, article, or book on archery and report to your club. (This elective may be repeated by reading different articles.)
2. Organize and lead an archery game.
3. Make a set of arrows. You may purchase parts. They should be suitable for your bow and draw.
4. Make a bowstring.
5. Demonstrate how to adjust the brace height or fistmele of a bow.
6. Make a finger tab.
7. Make a quiver.
8. Make a butt or mat.
9. Make an archery target.
10. Set up an archery range at your home.
11. Attach a bow sight to your bow and learn how to use it.
12. Practice clout shooting until you are reasonably accurate.
13. Participate in a field archery match or tournament.
14. Prepare an Archery Quiz for your club to take. (20 questions)
15. Design and make a self-bow.
16. Design your own archery elective(s):

Electives *Outdoorsmanship* (*Make a notation of which one is used for each level*)

1. Participate in a community, roadside, campground, or stream bank cleanup. (This elective may be repeated.)
2. Make a map that will show someone else how to get to one of your favorite places.
3. Complete a five-mile hike.
4. Complete a ten-mile hike.
5. Demonstrate how to determine directions without a compass.
6. Build a safe campfire and put it out.
7. Make an overnight hike and camp where you must carry everything you need for at least one mile.
8. Cook a meal over a campfire for yourself and one other person.
9. Go hunting with a parent or friends and make a report about wildlife you saw.
10. Volunteer to be a 4-H camp counselor.
11. Give a public presentation on how to pack a backpack for an overnigher.
12. Give a talk about safety and survival in the woods.
13. Design your own elective(s) on outdoorsmanship:



4-H Archery Electives

Electives *Personal Development* *(Make a notation of which one is used for each level)*

1. Lead the “Pledge of Allegiance” and “4-H Pledge” at a 4-H meeting.
2. Lead a song or a game at a 4-H meeting.
3. Preside at a meeting that includes more than just your 4-H club.
4. Write a news story for a local paper.
5. Give a presentation before a group larger than your 4-H club.
6. Serve as host for a 4-H club meeting at your house. See that everyone is welcomed and made comfortable. Provide refreshments for everyone.
7. Participate in an Archery Tournament outside your 4-H club.
8. Participate in a radio or TV program.
9. Visit several elderly persons in your community and tell them about your 4-H archery activities.
10. Teach several young people in your community how to safely use a bow and arrow.
11. Teach archery at a 4-H or other youth camp.
12. Design your own elective(s) on personal development.

Electives *Wildlife Study & Conservation* *(Make a notation of which one is used for each level)*

1. Read about and/or observe and report on some wild animal, bird, or fish. (This elective may be repeated.)
2. Find and identify the tracks of five wild animals.
3. Observe and identify ten birds.
4. Find and identify ten native forest trees.
5. Find and identify ten wildflowers or other forest plants, not trees.
6. Find and identify ten kinds of aquatic animals such as crayfish, mussels, water striders, starfish, and salamanders.
7. Collect and identify ten insects, ten plants, ten leaves, or ten shells.
8. Explain igneous, sedimentary, and metamorphic rocks.
9. Explain how some land feature such as a hill, canyon, or lake was formed.
10. Build a birdhouse or bat house and put it up in a good place.
11. Show slides of some wildlife at a 4-H meeting.
12. Plant ten trees and care for them.
13. Visit a wild bird refuge and make a report about your visit at a 4-H meeting.
14. Design your own elective(s) on wildlife and conservation:



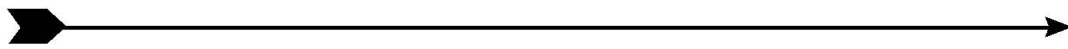
4-H Archery Electives

Electives *STEM Development* *(Make a notation of which one is used for each level)*

1. Build and launch a rocket. How does the rocket resemble the flight of an arrow?
2. Make a rubber band model car. Where does the energy to move the car come from? Relate this to a compound bow, and where its energy comes from.
3. Determine how much your arrow falls per yard. Graph it at 10 through 60 yards.
4. Make a catapult from popsicle sticks and rubber bands.
5. Make a model of a wind generator and explain how it works.
6. Explain and demonstrate surface tension and light refraction in water.
7. Explain how a combustion engine works.
8. Explain kinetic energy. Where is kinetic energy used in archery?
9. Research technical advances in arrows or bows and give a public presentation to your county or club.
10. Determine your eye dominance. See if you can predict other club members' dominant eye. How did you do it?
11. Demonstrate how a pulley works and relate it back to a compound bow.
12. Explain how the mass of an arrow affects the distance an arrow travels. Caution; don't go under manufacturer's recommended arrow weight.
13. How does the angle of firing affect the distance?
14. Explain the archers' paradox to your club.
15. Design your own elective(s) on STEM development.

Electives *Healthy Living and Citizenship* *(Make a notation of which one is used for each level)*

1. Volunteer at a homeless shelter.
2. Plant and harvest a vegetable garden.
3. Participate in a beach, stream, or park clean up.
4. Exercise 30 minutes a day and keep a record of it for a month. Note your overall fitness change. Focus on muscles used for archery.
5. Track your eating habits for a week and see if you are receiving the correct dietary needs for your body.
6. Attend the 4H council meeting or county council and report to your club on what happened.
7. Participate in Know Your Government.
8. Plan and carry out a beach, stream or park clean up.
9. What does "ethics" mean to you? Record your definition in your record book.
10. Give a public presentation on why good sportsmanship is important.
11. Draw a timeline for archery history in the Olympics. Use it to give a presentation at your club meeting or a community gathering.
12. Research healthy snacks. Demonstrate to your club what you would pack for healthy snacks for an archery match.
13. Using a pedometer, count your steps during an archery 3D match. How far did you go in feet? In yards?
14. Interview your county or city officials about what laws are in place to govern archery in your community. Report back to your club.
15. Design your own elective(s) Healthy Living and Citizenship:



COMMON ARCHERY TERMS

ADDRESSING THE TARGET—The archer's stance straddling the shooting line prior to shooting the arrow.

AIM—Visually lining up a sight pin to the center of the target; if a sight is not used, visual placement of the tip of the arrow on a specific point while shooting at a target over a given distance.

AIMING POINT (used in point of aim)—(1) A small object placed on the ground between the archer and the target. When the tip of the drawn arrow is in line with the archer's eye and the aiming point, the arrow should hit the target. The aiming point is moved until the arrows hit the target. Used in practice to develop uniform position and release, and for lawn archery. (2) Any object above or below the target on which the archer sights.

ANCHOR—Consistent placement of the drawing hand to a position on the face, mouth, or jaw when the bow is drawn fully.

ANCHOR POINT—A spot on the archer's face, chin, or cheek to which the archer habitually draws the bowstring. The fixed position of the bowstring hand on the jaw or cheek while holding or aiming.

ARCHER'S PARADOX—Situation in which the arrow flies in the direction aimed although its initial movement is in a different direction. An arrow must bend to fly straight.

ARM GUARD—A piece of leather or stiff material worn on the forearm to protect it from injury by the bowstring or a broken arrow. Device worn on forearm and wrist areas of the bow arm to protect the arm from impact.

ARROWHEAD—The point of an arrow, particularly when fashioned for hunting.

ARROW PLATE—A piece of material that is glued to the side of the bow at the point where the arrow contacts it. It provides protection for the bow from the friction of the arrow. The piece to which the arrow rest is attached.

ARROW REST—Device mounted just above the arrow shelf on the bow on which the arrow rests during draw, hold and release. A small protrusion on the bow at the point where the arrow will rest during the draw.

ARROWSMITH—Individual specializing in making arrows and/or arrowheads.

BACK—The side of the bow away from the archer. The side of the bow limb away from the string.

BACKED-BOW—A bow with a strip of other material glued to its back to give it greater strength or cast.

BARBED ARROW—An arrow with barbs designed for hunting and fishing so it will not come out. Illegal for hunting game birds or animals in Washington State, but may be used for bow fishing for carp.

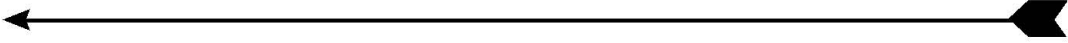
BARBS—The sharp points of an arrowhead that project backward.

BARE BOW—A bow without a bow sight. Method of shooting which does not use a bow sight.

BARE SHAFT—An arrow that has a point and nock on it but nothing else. This arrow is used in bow tuning.

BARRELLED ARROW—An arrow that is larger in the middle than at the ends.

BILLET—One of two short pieces joined at the handle to make a bow.



BLUNT—Arrow with a blunt point for use on small game. Blunt-pointed arrows are often used for small game.

BOLT—The projectile shot from a crossbow.

BOW ARM—The arm that holds the bow while shooting.

BOW HAND—The hand in which the bow is held.

BOW REEL—A reel attached to the bow for bow fishing.

BOW SIGHT—An aiming device attached to the bow.

BOW STRING—String of a bow, usually made of Dacron.

BOWYER—A maker of bows.

BRACE—To string a bow, to place the loops of the bowstring in the notches of the bow.

BRACING—Process of stringing the bow in preparation for shooting, by placing the bowstring loops into position in the notches of the bow.

BRACE/STRING HEIGHT—The distance between the pivot point of the strung or braced bow and the bowstring. AKA—Fistmele.

BROAD HEAD—A hunting point with two or more cutting edges. Mechanical broad heads were made legal to hunt with in Washington State in 2015.

BUTT OR MAT—A backstop usually made of straw, cedar tow, or sod on which the target is placed.

CANT—To hold the bow tilted or slightly turned while shooting.

CAST—The force and speed imparted to the arrow by the bow.

CLOUT—A white object such as a cloth placed on a stake as a mark for long-range shooting.

CLOUT SHOOTING—Shooting at a relatively long distance at a large target lying, or painted, flat on the ground.

COMPOSITE BOW—Bow composed of two or more materials, such as wood and fiberglass.

COMPOUND BOW—Bow invented by H.W. Allen in 1966, designed with an eccentric pulley system to maximize pull weight poundage at mid-draw and minimize stacking at full draw.

CREEPING—Undesired forward motion of the bowstring from the anchor point immediately prior to release.

CREST—Painted bands on arrows for identification. Colored bands on the arrow used to identify a set.

CROSSBOW—A bow fixed on a stock that has a groove or barrel to direct the bolt, a notch or catch to hold the bowstring, and a trigger to release the string. Illegal for hunting during bow season in Washington State, but legal during rifle season.

DIRECTOR OF SHOOTING—The individual in charge of shooting. AKA—Field Captain; Lady Paramount.

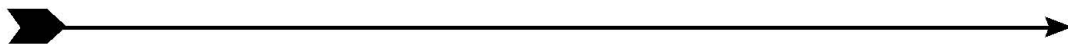
DOUBLE ROUND—Shooting the same round twice.

DRAW—The process of moving the bowstring with nocked arrow from brace height to the archer's anchor point on the face.

DRAW LENGTH—The length, for a given archer, from the face of the bow, to the bowstring in his fingers at full draw.

DRAW WEIGHT—See weight.

DRAWING ARM—The arm that draws the bowstring.



DRY FIRE—The releasing of a bowstring when at full draw without an arrow attached. This event may cause the bow to break or splinter in the limbs.

DRIFT—Natural deflection of an arrow from its normal path due to outside factors such as wind.

END—A set number of arrows which are shot before going to the target (typically 3, 5, or 6) to score and retrieve them.

END LOOP—The part of the string fitting over the bow tip and into the notch.

FACE—The side of the bow toward the archer. The side of the bow nearest the string. AKA —Belly.

FIELD ARCHERY—Shooting arrows at targets at varying distances over different types of terrain, usually in woods or courses similar to golf courses. Targets are Black and White.

FIELD ARROW—A heavy duty arrow adaptable for hunting.

FINGER TAB—A piece of leather or other material used to protect the three fingers used on the bowstring to prevent blistering on the surface of the three drawing fingers.

FISHTAILING— Undesirable arrow movement. The nock end of the arrow will appear to move from side to side as the arrow follows its flight path.

FISTMELE—An old English term that measured the distance between bowstring and bow handle when strung, but not drawn. Today's term is Brace/String Height.

FLETCH, FLETCHING—(1) To attach feathers or plastic vanes to an arrow; (2) feathers or guiding vanes on an arrow; (3) The stabilizing feathers attached to an arrow between the nock and crest.

FLIGHT ARROW—An arrow made for long distance shooting. This arrow is light weight and has very small fletchings.

FLIGHT BOW—A strong bow used to shoot a great distance.

FLIGHT SHOT—A shot for distance.

FLU-FLU—An arrow with large or spiraled fletchings, which increase drag and reduce the arrow's range.

FOLLOW-THROUGH—The act of holding the release position until the arrow has struck the target.

FREESTYLE—Using a bow sight; a tournament classification allowing the use of a bow sight.

GRIP/HANDLE—The center portion of the bow where the hand exerts pressure during the draw.

GROUPING—A close clustering of arrows on the target.

GROUND QUIVER—Heavy wire shaft with a loop at the top or other device to hold arrows while target shooting, and to hold the bow while retrieving arrows from the target.

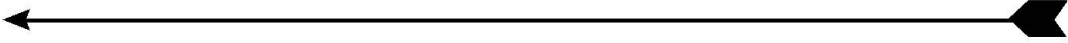
HANDLE—The rigid center portion of the bow, which is held when shooting.

HANGING ARROW—An arrow that does not penetrate the target, but dangles from its point.

HIT—An arrow which embeds itself within one of the scoring areas on the target face.

HOLDING—The act of maintaining the bow and arrow in a stable position while aiming at full draw prior to release.

INDEX FEATHER—Usually a different color; should be away from the bow when the arrow is nocked, except on some compound type arrow rests.



INSTINCTIVE SHOOTING—Shooting without a sight, aiming with both eyes on the target, used for quick shooting.

JOINTED BOW—A bow whose limbs are joined at the handle; may be separated or folded for carrying and storing.

KICK—A bow is said to “kick” when a jar is felt to the bow hand after a shot.

KISS BUTTON (KISSER)—An object on the string of a bow. It is used by sight shooters to establish a better anchor point. The object is touched by the lips when holding. A contact point on the bowstring for the archer's lips to touch as to insure consistency and accuracy of the anchor point.

LAMINATED BOW—One made of several strips of different materials and glued together.

LAMINATED—Composed of several layers.

LET DOWN—Releasing tension after drawing without releasing the arrow.

LET OFF—A bow is said to have let off, if the holding weight is less than the draw weight.

LIMB—The energy-storing parts of the bow located above and below the riser. Working (flexible) portion of bow, called upper and lower.

LONGBOW—A long, relatively straight bow, five or more feet long, that preceded the recurve bow in many cultures.

MINNOWING— Undesirable arrow movement caused by a clearance problem. The nock end of the arrow will appear to move from side to side as the arrow follows its flight path, but less movement than Fishtailing.

NFAA—National Field Archery Association

NOCK—Device on the end of the arrow opposite the point, made with a groove for holding the arrow to the bowstring when placed in position for shooting.

NOCKING—The technique of placing the arrow on the bowstring in preparation for shooting.

NOCK SET—The stops on the serving of the bowstring which mark the nocking point for the arrow.

NOCKING POINT—The position on the string where the arrow is placed. Typically marked by the nock set.

NOTCH—The slits at the ends of the bow for the string.

OVERBOWED—Using a bow beyond one’s strength.

OVERDRAW—Drawing the arrow beyond the face of the bow or drawing the bow to its point of maximum stress on the limbs.

OVERSTRUNG—Using a bow that has too great of a brace height. (Too short of a string.)

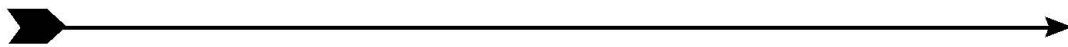
PEEKING—Undesired motion of the archer's head at time of release in an attempt to follow the arrow trajectory into the target.

PETTICOAT or SKIRT—The portion of the target outside of the scoring area.

PIVOT POINT—The point on the face side of the bow handle which is the deepest part of the bow grip, approximately the center of the riser.

PLUCKING—Undesired lateral motion of the string hand and arm away from the bowstring at time of release.

POINT/PILE—The tip of the arrow that pierces the target. Classifications include—target; field; broadhead; and blunt.



POINT BLANK RANGE or POINT ON—Aim taken at a distance where the point of the arrow is in line with the archer's eye and the center of the target. Distance at which the archer may utilize the center of the target as an aiming point.

POINT-OF-AIM—A technique, whereby the archer uses a mark unattached to the bow and usually on the ground as an alignment point.

PORPOISE—The undesirable up and down motion of an arrow in flight.

PRESSURE POINT—Place on the arrow plate against which the arrow lies and exerts pressure when the arrow is released. It can be cushioned or spring loaded.

QUARTERING WIND—A wind blowing obliquely (sideways) across the target.

QUIVER—A holder or sheath for carrying arrows. Any device designed to hold arrows not being shot.

RANGE—Area designated for target or field archery.

RANGE FINDER—A device that measures distance.

REBOUND—An arrow that bounces off the target face.

RECURVE BOW—A bow with tips that curve back in an arc; curvature usually 10–12 inches from end. Bow manufactured so the ends of the limbs deflect toward the back of the bow to increase leverage when the bow is braced. In 1953, Fred Bear Patented in Canada, the modern working recurve limb.

REFLEXED BOW—A bow which when unstrung bends in the opposite way to its curve when strung.

RELEASE—The act of putting the arrow into flight due to a release of pressure on the bowstring. To loose (shoot) an arrow from a drawn bow. AKA—Loose.

RISER—The areas of the bow just above and below the grip.

ROUND—A prescribed number of arrows, ends and games, shot at prescribed distances at specific target faces or targets.

ROVING—Shooting a specified range at random objects at unknown distances.

SELF-BOW—A bow made of a single piece of wood, not laminated or backed.

SERVING—A wrapping of thread around the bowstring at points of wear, where the arrow is nocked, center serving, and on the end loops.

SHAFT—The body of the arrow upon which the nock, fletching, and point are mounted, and the crest is printed.

SHAFT FEATHERS—The two feathers on either side of the index feather. Traditionally, these feathers are not as flamboyant as the index feather. AKA—Hen Feathers.

SHELF—A bow shelf, is the place an arrow rests before shooting, if the bow does not have an arrow rest.

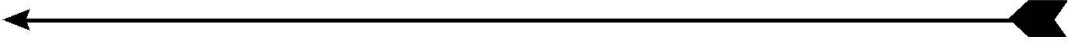
SHOOTING LINE—The line straddled by archers during shooting which indicates a specific distance from the target in target archery.

SIGHT/BOWSIGHT—Adjustable device attached to the bow which facilitates the aiming process for the archer.

SIGHT—(1) To aim; (2) a device placed on the bow and/or how to enable the archer to aim directly at the center of the target.

SIGHT WINDOW—The opening provided by an offset section of the bow to allow the arrow to point straight ahead.

SKIRT/PETTICOAT—The outermost perimeter of the target face outside the scoring area.



SPINE—The stiffness of an arrow. Arrows should be matched in stiffness to the weight or cast of the bow. The measured deflection of an arrow when depressed by a two-pound weight at its center.

STABILIZER—Weighted device added to the riser of the bow and designed to reduce torque and absorb shock upon release.

STACKING—Disproportionate increase in bow weight during the last few inches of the draw.

STANCE—The act of placing the feet under the body to achieve a balanced stance.

STAVE—Full-length piece of wood used to make a bow.

TACKLE—Equipment used by an archer.

TARGET CENTER—The center of the target or that part of the target face with the highest scoring value.

TARGET CAPTAIN—Individual at each target designated to determine and call the score of each arrow and pull them from the target.

TARGET FACE—The scoring area of the target.

TARGET LINE—A line placed 5 feet in front of the target.

TARGET PANIC—A psychological—and perhaps neurological—condition experienced by many archers, both competitive and recreational. The condition has various effects on archers. Target panic was originally blamed on high levels of anxiety and a "fear of failure", but is now understood to be caused by the way in which the brain learns at a neurological level. Treatments based on this new paradigm have been very effective at treating target panic in archers up to the Olympic level. Inability to release an arrow or releasing before full draw.

TILLER—Device for holding the bow at draw and to inspect the curvature.

TOXOPHILITE—One who loves, studies, and practices archery; one that studies the history and archaeology of archery. Individual pursuing the sport of archery, as a participant and/or student.

T-SQUARE—Device used to measure brace height and locate the nocking point on the bowstring.

TRAJECTORY—The parabolic flight pattern of an arrow following release. The path of an arrow in flight.

TUNING—Adjustment of arrow rest, pressure point, string height and nocking height to improve arrow flight; includes determination of correct spine.

UNDERSTRUNG—A bow whose string is too long.

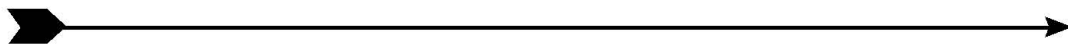
VANE—A term used most commonly when fletching is made of plastic or rubber instead of feathers.

WAITING LINE—A line where the archer waits behind before moving to the shooting line.

WEIGHT/DRAW WEIGHT—The bow manufacturer's determined number of pounds required to draw each bow's string at a given draw length. The force (strength) required to draw the bow the length of the arrow, usually 28 inches.

WINDAGE—(1) The influence of the wind on an arrow in flight; (2) the extent of such deflection; (3) same as drift.

WINDOW—Viewing space between the side of the bow and the string at full draw. The window is the hollow out portion of the bow. Long bows don't have windows.



ROUNDS

Freeman Round NFAA

This round consists of 60 arrows shot as three games at distances of 10, 15, and 20 yards. Each game includes four ends of five arrows.

First Game—Three ends at 10 yards; one end at 15 yards.

Second Game—Three ends at 15 yards; one end at 20 yards.

Third Game—Four ends at 20 yards.

The target is the standard NFAA indoor target of 40 centimeters with a blue-and-white face and an 8-centimeter center ring, scored 5, 4, 3, 2, 1.

Indoor Round NFAA

This consists of 60 arrows shot as three games at a distance of 20 yards. Each game has four ends of five arrows per end. The target and scoring are the same as in the NFAA Freeman Round.

Indoor Round FITA

This consists of 30 arrows shot at a distance of 18 meters. Shooting is done in ends of three arrows. The target consists of a 40 centimeter multi color 10 ring. Scoring is a 10, 9, 8, 7, 6, 5, 4, 3, 2, and 1 from the inside to the outside ring. This target has an “x” ring that is scored as a ten for recurve bows. Compound bows use the “x” ring to be the ten ring.

900 Round FITA (17 to adult)

This is an outdoor target round. The course is set up in an open area. A 122-centimeter (48-inch) five-color target with 10-ring scoring is used. Scoring, from center out, is 10-9-8-7-6-5-4-3-2-1. The distances and number of arrows are:

30 arrows at 60 meters

30 arrows at 50 meters

30 arrows at 40 meters

They are shot in “ends” of six arrows. This means the score is checked after each end of six arrows have been shot.

Junior 900 Round FITA (13 to 16) *

This is similar to the 900 round. The target face and scoring are the same; the distances are shorter. Distances and numbers of arrows are:

30 arrows at 50 meters

30 arrows at 40 meters

30 arrows at 30 meters

Easton Round FITA (17 to adult)

A 122-centimeter (48-inch) target is used with 10-ring scoring. It is shot in ends of five arrows.

20 arrows at 60 meters

20 arrows at 50 meters

20 arrows at 40 meters

Junior Easton Round FITA (13 to 16) *

A 122-centimeter (48-inch) target is used with 10-ring scoring. It is shot in ends of five arrows.

20 arrows at 50 meters

20 arrows at 40 meters

20 arrows at 30 meters

*** (12 and under subtract 10 Meters)**



Field Round NFAA

Go to a certified archery range and shoot its course. This course is set up in the woods and takes a lot of space. Course has 14 different targets at known distances. Course is shot twice for 28 targets. Max score 560. Total Arrows 112.

Standard Unit: A standard unit shall consist of 14 targets. Twice around the unit makes a round or two such units make a round.

At the following distances four arrows shall be shot from the same stake:

15, 20, 25, 30 yards at a 35 cm. target

40, 45, 50 yards at a 50 cm. target

55, 60, 65 yards at a 65 cm. target

The following are four position shots, each arrow to be shot from a different position or at a different target:

35 yards at a 50 cm target, all from the same distance, but from different positions.

45, 40, 35, 30 yards at a 50 cm. target (Walk up as you shoot)

80, 70, 60, 50 yards at a 65 cm. target (Walk up as you shoot)

35, 30, 25, 20 feet at a 20 cm. target (Walk up as you shoot)

These targets has an "X" ring which counts 5 points. The target is made up of two colors black and white. There are rings in each color but only the colors are scored. Center black is worth 5 points, the white is worth 4 points and the outer black is worth 3 points.

Youth (age 12-14) shoot at a shorter distance and youth (age 8-11) shoot at even a shorter distance.

These distances can be found in the "Constitution and by laws of the NFAA appendix 4".

Acknowledgments and Resources

4-H Shooting Sports Guide. 1992. National Shooting Sports Development Committee, Ronald A. Howard, Jr., Purdue University, W. Lafayette, Indiana

National Archery Association Level 1 Basic Instructors Course, Second Edition. 1995. National Archery Association of the United States, Colorado Springs, Colorado.

Oregon 4-H Archery Member Manual, 4-H 361. Reprinted 2009. Oregon State University Extension Service, Corvallis, Oregon.

Boy Scouts Of America Merit Badge Series Archery, 35856 ISBN 978-0-8395-3259-0 ©2004 Boy Scouts of America 2010 Printing

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