

MERIT BADGE SERIES



ARCHERY



SCOUTING AMERICA
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ARCHERY



"Enhancing our youths' competitive edge through merit badges"

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Note to the Counselor

Scouting America Standards

The merit badge counselor must be sufficiently experienced in archery activities to teach Scouts the necessary skills and to respond effectively in the event of an emergency. We recommend the counselor use the most current printing of the *Archery* merit badge pamphlet, No. 35856; the *Guide to Safe Scouting*, No. 34416; and the *Scouting America National Range and Target Activities Manual*, No. 30931, for further details.

Archery Activities

Modern bows and arrows are potentially dangerous. It is important for Scouts to understand what a projectile is, and why any device that shoots a projectile at high speed must be handled with care and respect and used only in approved locations. As counselor, you must take responsibility to comply with Scouting America requirements and with all state and local laws. Additionally, you must ensure that all shooting activities are conducted on established and clearly marked target or field archery ranges with appropriate supervision by a certified USA Archery Level 1 Instructor or a certified long-term camp staff member (i.e., a National Camping School [NCS] Range Activities Director; or a Rangemaster over age 18 who is trained by a NCS Range Activities Director or by a USA Archery Level 1 Instructor). The following are standards established for bows and arrows used in Scouts BSA.

Safe Area or Course

A key part of the counselor's responsibility is to know the range or course for conducting archery activities and to determine that it is well-suited and free of hazards. Safety procedures include but are not limited to:

- Inspect the range before use for any conditions that might pose a potential hazard to safe operation.
- Range flags must be flown while the range is in use.
- Range perimeter should be well-defined and the target line, shooting line, and waiting line must be well-marked.
- All spectators and archers waiting to shoot must remain behind the waiting line at all times.

- Bows and arrows should be used only in supervised places set aside for their use.
- On a field archery course or roving range, when searching for a lost arrow, participants should leave their bow standing against the target face and have a responsible person standing by to intercept other archers who may follow. Stay on marked paths. Travel the direction in which targets are marked.

Equipment Selection and Maintenance

The counselor should inspect all equipment to ensure bows, bowstrings, and arrows are in safe condition and appropriate for the Scout's height and maturity. Care should be taken to break and discard all cracked or fractured arrows. Draw a bowstring only with a nocked arrow of proper length. Failure to do this may result in overdrawing and breaking the bow or in personal injury.

Personal Safety Equipment

The counselor must ensure that each participant always wears an arm guard and either a finger tab or glove while shooting.

Safety Procedures and Policies

Adherence to archery safety procedures and standards can greatly reduce risk. These should be known and understood by all participants, and the counselor must ensure compliance. Here are some commonsense safety rules:

- A bow, like a firearm, must never be pointed at a person.
- Never release an arrow without being able to see its full, clear path to the target.
- Before drawing a bow, make sure the range is clear of any persons or animals and that the archer is straddling the shooting line.
- Arrows should be nocked only on the shooting line at the rangemaster's signal and pointed only at the target.
- Stop shooting immediately on signal from the rangemaster or if anyone crosses in front of or behind the target.
- Never shoot an arrow up into the air.
- Broadhead arrows are for those who are licensed to hunt. They are not permitted in Scouting target archery activities.

Discipline

Scouts must respect their counselor and rangemaster at all times and follow their direction. Participants should always practice courtesy and good sportsmanship.

Requirements

Scouts should go to www.scouting.org/merit-badges/Archery or check Scoutbook for the latest requirements.



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Bow and Arrow

A Scout who picks up a bow and arrow becomes heir to one of humankind's oldest legacies. Archery plays a large part in stories of Cherokee hunters and is at the heart of the Robin Hood legend. The Huns were famous for their composite ox-horn bows, and the Moguls of India made bows entirely of steel. Archery remains a living and vibrant sport that is still practiced throughout the world.

The modern laminated recurve and compound bows look little like the primitive bows our ancestors used, but essentials of archery are unchanged. A steady hand, a good eye, and a disciplined mind are key for the modern archer.

Archery is a fun way to exercise minds as well as bodies. The sport has dozens of variations. Many archers start with target archery, shooting arrows at a five-color, 10-ring target. But the sport also offers field archery, clout archery, 3-D archery, action archery, walk-up rounds, and many others.

A *composite bow* is made of more than one material. The first composite bows were made of wood, bone or horn, and animal tendons. A *laminated bow* is a composite bow made of layers of such materials that have been glued together. A *recurve bow* curves back on itself. A *compound bow* has a cable system that makes the bow easier to draw. You will learn more as you earn the Archery merit badge.



Newcomers will find archery challenging and enjoyable. If you already are an archer, then we hope to increase your understanding and appreciation of archery.



Archery Safety Rules

Archery is lots of fun, but fun can quickly turn into tragedy unless every archer observes some commonsense safety rules. As a Scout and an archer, you must learn and practice these simple rules any time you are using a bow and arrow.

Archery Range Safety Rules

A. Five Range Safety Rules

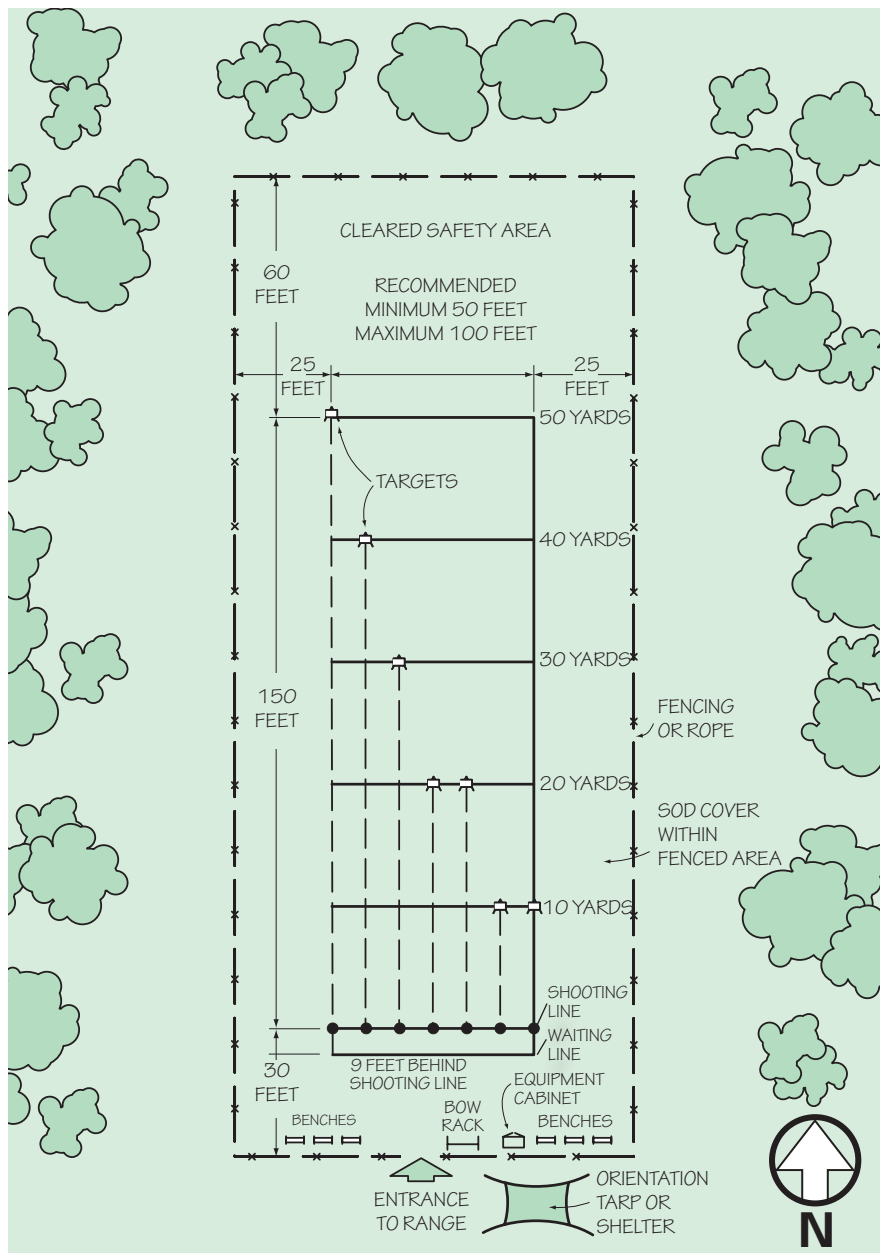
1. Always walk on the range.
2. Keep your arrows in your quiver until told to shoot.
3. Only release the bow string when an arrow is nocked and safely pointed toward the target
4. Leave dropped arrows on the ground until instructed to retrieve them.
5. If there is an emergency on the range immediately alert the Instructor.

B. Three Rules When Retrieving Arrows

1. Retrieve arrows only when the shooting line is clear and the range officer signals "Retrieve your arrows."
2. As you walk forward to the target waiting line, pick up any arrows on the ground (your own and all others as well).
3. Only one archer at a time may pull arrows from the target; all others stand 6 feet back from the target at the target waiting line.



Before you think about using a bow, learn these safety rules and make up your mind to follow them *every time* you are on an archery range or anywhere else shooting a bow. Remember that most accidents are the result of carelessness and thoughtlessness.



C. Range Commands

The whistle commands used on a range, and their related verbal commands, are as follows.

1. **Two blasts on a whistle—"Step to the shooting line."** You may step to the shooting line and pick up your bow. You may not pick up any arrows.
2. **One blast on a whistle—"Commence shooting."** You may pick up an arrow and shoot this *end*. When you are done, put your bow in a bow stand and step to the waiting line.
3. **Three blasts on a whistle—"Retrieve your arrows."** You may go downrange and retrieve your arrows. Follow the three rules for retrieving arrows (above).
4. **Four or more blasts on a whistle—"STOP!" or "Cease fire!"** Do not shoot. Immediately *let down*, place your arrow in your quiver and your bow in its stand, and step back to the waiting line until the emergency is cleared.

An **end** is the number of arrows shot (usually three to six) during one turn.

To *let down* is to slowly relax the bowstring without releasing the arrow.

General Archery Safety Rules

- Keep all arrows in their quiver until ready to shoot.
- 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.
- 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.
- 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.
- 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.
- Use arrows that are the proper length for you. Arrows that are too short can cause serious injury.



A **fletching** refers to an arrow's feathers or plastic vanes.

- Never shoot an arrow up into the air.
- 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.
- When retrieving arrows from behind a target, particularly 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.
- Always use proper safety equipment, including an arm guard and a finger tab or glove. A bow sling is not required but is recommended.
- Always inspect your equipment before shooting. Repair or replace damaged equipment. Replace the bowstring when it becomes worn.
- 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.



Laws on Archery

Many states and local communities have laws governing archers. Some laws cover ownership and registration of archery tackle (equipment). Others govern hunting and fishing with a bow and arrow.

On the shooting range, the range officer or rangemaster on duty serves as the person in charge. The rangemaster is there to help ensure the safety of all participants and bystanders, and to ensure the range is a safe environment for archery shooting. Therefore, for your own safety and the safety of others, it is imperative that you respect the rangemaster and follow all rules as posted.

Archery equipment is shown and described in the next section.



Ask your merit badge counselor or members of a local archery club about the laws in your area. Learn and follow all state and local laws on using a bow.



Archery Equipment

Having the right equipment is as important as having proper instruction in how to shoot. Your equipment should fit you and fit the type of shooting you plan to do. Have an experienced archer help you choose the right equipment.

The equipment you will need includes a bow (a longbow, recurve bow, or compound bow), arrows and a quiver to hold them, an arm guard, a tab or shooting glove, and a bow sling.

Choosing and shooting a compound bow is different from choosing and shooting longbows and recurve bows. In this pamphlet, see “Option A: Recurve Bows and Longbows” or “Option B: Compound Bows” for information about the type of bow you will be shooting.

Arrows

An arrow has four parts: the **shaft** (body or stem), the **nock** (notched tip), the **fletching** (feathers or vanes), and the **point** (arrowhead). The **index** fletching is the odd-colored fletching and is perpendicular (at right angles) to the slot in the nock.

POINTS

Different types of arrows have different points. The arrow in the parts photo is a **target arrow**. Several other arrow points also are shown on the next page. **Broadheads** are used for bow hunting big game. The **fish head** is for bow fishing. **Blunts** are used for practice and for hunting small game such as squirrels and game birds. The **field point** is used when shooting field rounds and when shooting at stumps and hummocks on roving trips through fields and forests.



Parts of an arrow

Different arrow points

BROADHEAD



FISH HEAD



BLUNT



TARGET POINT



FLETCHINGS

You also can tell arrows apart by their fletchings.

- Target arrows use small fletchings. These can be feathers from 2 to 3 inches long or plastic vanes about 1½ to 2 inches long.
- *Flu-flu* fletchings are used to limit the range of an arrow. These fletchings are most often used on blunt-tipped arrows. They slow the arrow's flight and make it drop quickly.
- Hunting arrows use longer fletchings, usually 4 to 5 inches long. The fletchings usually have a strong spiral that causes the arrow to rotate, which improves its flight when the point is a broadhead.

SHAFT MATERIALS

Modern arrow shafts are made from four principal materials: wood, aluminum, fiberglass, or carbon fiber. Beginning archers usually use arrows with wood shafts. Wood is the least expensive shaft material and is popular with many archers. Port Orford cedar from the Pacific Northwest is the preferred wood shaft material because of its straight grain and light weight.

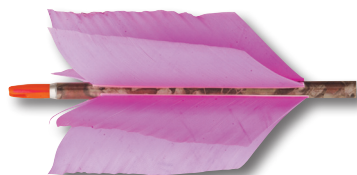
Wood was the only arrow shaft material until about 1947, when aluminum shafts became available. Aluminum shafts are straighter than wood and do not warp with humidity the way wood does. An aluminum shaft will, however, bend if it hits a hard surface with enough force. Bent shafts must be straightened to be used safely.

Fiberglass shafts were introduced in the 1960s. Fiberglass will stand up to more abuse than either wood or aluminum shafts. Although fiberglass shafts are reasonably straight, they are not as straight as good aluminum or carbon fiber shafts. Fiberglass, the heaviest of all shaft materials, is more expensive than wood but less expensive than aluminum or carbon fiber.

Types of fletchings



TARGET ARROW FLETCHING



FLU-FLU FLETCHING

Carbon fiber shafts were introduced in 1983. They are the lightest, strongest, and most expensive shafts. Carbon fiber is the preferred shaft material of today's competitive archers.

Matching Arrows to Your Bow

When selecting arrows, it is important to match them to your bow. Matched arrows will fly truer and be more accurate than those that are not matched.

To match arrows to your bow, you must know the *draw weight* of your bow and your *draw length*. Together, these figures will determine the *spine* of the arrow you need. Spine is a measure of the stiffness of an arrow shaft relative to its thickness, weight, and length.

The draw weight of your bow is the amount of pull (measured in pounds) that is required to draw (pull back) an arrow its full length. A bow's draw weight is marked on its handle. (For more about draw weight, see "Option A: Recurve Bows and Longbows" or "Option B: Compound Bows.")

Try to test a variety of arrows before you buy your own. When you order arrows, include your bow draw weight, arrow length, and the type of arrow you need: target, field, or hunting. Also specify the fletching and the type of point you need. With this information, you will be able to get a perfect match for your bow.

Care of Arrows

Take care of your arrows. Improper care can affect accuracy and cause injury. Look for signs of damage before, during, and after shooting. Start with the nock and work your way to the point. If the nock is cracked or broken, replace it. If feathers or vanes are coming off, glue them back in place. To reshape crushed feathers, try holding them over steam from boiling water. The heat and moisture will smooth the feathers and make the barbs stand up.

Check the shaft for straightness. If an arrow is bent, put it aside and straighten it after you are done shooting. Check wood, fiberglass, or carbon fiber arrows for cracks or splinters in the shaft. Break a cracked or splintered arrow in half and



throw it away. A cracked or splintered arrow, if shot, could explode and cause serious injury. Lightly sand and polish any rough spots in an arrow's finish.

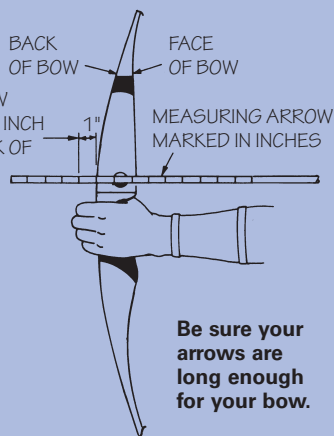
Check for missing or dulled points. Missing points must be replaced. Hone dulled points with a fine file, then clean them with steel wool.



Store your arrows where they will not get wet or undergo temperature change. Many archers have special cases for storing their arrows. Others keep them in quivers hanging on a wall. Never put anything on top of your arrows; this could damage the fletching and bend the shafts.

The draw length of your arrow can be measured several ways. The best way to determine correct arrow length is to draw a special measuring arrow that has been marked every inch, like a ruler. When you are at full draw, your correct arrow length is read from the marked arrow where it crosses the back of your bow.

SELECT AN ARROW LENGTH THAT IS 1 INCH BEYOND THE BACK OF THE BOW.



Be sure your arrows are long enough for your bow.

Another way to estimate proper arrow length is to stand with both arms extended in front of you with your fingertips touching. The distance from your fingertips to the base of your neck will give a close estimate of your correct arrow length.

To make common repairs, follow the instructions for attaching nocks, points, and feathers in the section “Making Arrows.”

Quivers

Quivers hold your arrows when you are shooting. The style of quiver you choose will depend on the type of archery you shoot.

- **Belt quivers** attach to your belt and allow you to reach arrows easily. Styles include vertical, diagonal, hip, pocket, and holster.
- **Ground quivers** stick in the ground. They may have a rack to hold your bow as well as a container to keep your arrows upright.
- **Back quivers** sling over either shoulder. One drawback to these quivers is that you must reach high to withdraw an arrow, a problem if you are trying to sneak up on game or you are target shooting in a forested area.
- **Bow quivers** attach to the bow, giving hunters the convenience of carrying only one piece of equipment through the brush. Some field archers use bow quivers, but tournament archers usually find them too clumsy.



Belt quiver



Ground quiver



Back quiver



Bow quiver

Making an Arrow

Start with a bare shaft; attach a nock, a point, and three fletchings (and if you want, a crest) and you have made an arrow. Most archers make their first arrows with wooden shafts. The instructions that follow are for making an arrow with a wood shaft and feather fletchings. If you want to make an arrow with different materials, discuss the possibilities with your Archery merit badge counselor.



To make one arrow, you will need a fletching jig, an arrow shaft, a hand taper tool, a point, a nock, three fletchings, fletching glue or cement, and epoxy cement. Don't forget your Scout knife.

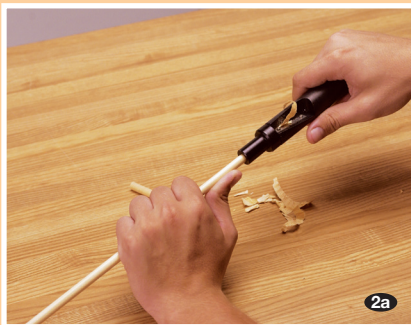
To make a wood arrow:

Step 1—Cut the shaft to length. The picture shows a Scout cutting a wood arrow shaft using a Scout knife. Refer to the previous section on “Matching Arrows to Your Bow” to decide how long you should make your arrow.



Step 2—Attach the nock and the point.

Tapers are needed on each end of the shaft to provide a good surface for gluing on the nock and the point. Cut the tapers as shown (2a), using a hand taper tool. The long taper is for the point, and the short taper is for the nock.





Put glue in the nock (2b) and spread the glue by twisting the nock onto the shorter taper (2c). The nock can be glued with fletching cement, but use a more rugged glue such as epoxy or hot glue for the point. Put the glue on the long taper, then twist the point onto the shaft to spread the glue and make a good bond.



Step 3—After the glue on the nock has set, attach the fletchings. Placing fletchings accurately requires a fletching jig, as shown in the photos.

Place a feather in the jig's clamp (3a) so that the rounded part of the feather is about $\frac{3}{4}$ inch from the back end of the clamp.

Spread fletching glue evenly along the edge of the feather held in the clamp (3b, next page).



Place the clamp in the jig. Make sure the fletching and the glue are in good contact with the shaft. The jig shown here uses a magnet to hold the clamp in place. Other jigs use the weight of the clamp to hold the fletching tight alongside the shaft. Do not hold these clamps in place. Let gravity do the job of holding the feather on the shaft while the glue dries.

When the glue has dried, rotate the jig's nock receiver 120 degrees until you hear a click. Repeat the above steps to glue the second fletching to the shaft. To complete your arrow, repeat the steps to glue the third fletching to the shaft.

Step 4—Once your arrow is finished, you might want to put a crest on it to identify it as yours. To add a crest, place a pattern of colored bands around the shaft about 2 inches in front of the fletchings. Put the crest close enough to the fletchings that it does not get buried in the target.



Arm Guard

Without an arm guard, your shirtsleeve or the skin of your lower arm will often “grab” the bowstring, causing you to shoot low.

The arm guard, worn over the arm that holds the bow, protects the forearm from the slap of the bowstring after the arrow is released. The arm guard also provides a smooth surface for the bowstring to strike. It usually is made of plastic or tough cordovan leather reinforced by a steel band. Adjustable elastic straps hold the guard snugly over the inside forearm.



The arm guard is the easiest accessory to select. Almost any commercial brand is suitable. Though absolutely essential, probably no part of the beginner's equipment is so often overlooked.

The hunting arm guard usually is wider and longer than guards used on field and target ranges. It has three or four straps instead of two.

Shooting Glove, Tab, or Mechanical Release Aids

Protect your shooting fingers with a shooting glove or tab. Even the lightest bow will soon make untrained fingers sensitive, eventually causing blisters. All archers should use finger protection, no matter how tough they think their fingers are. The most experienced and skilled archers always shoot with a glove or tab.



Shooting glove



Many top target archers use a tab because it gives greater control and a smoother release.

Shooting Glove

The glove type of finger protection has three fingertips connected to a wrist strap. The glove should fit snugly, but not tightly, over the three shooting fingers. Carefully select a glove that fits well and is comfortable.

Tab

The simplest and least expensive finger protection is the tab. Available in various forms, the tab generally is a loose flap of plastic or leather that lies over the fingers that draw the bowstring. As a beginner, you may find the tab awkward, but with a little practice you can become comfortable using one.

Without a glove or tab, the release of your arrow—which is the most crucial motion in shooting—may be faulty.

Store arm guards, shooting gloves, and tabs out of the sun; if they are made of leather, avoid getting them wet. Buff the leather when necessary.

Mechanical Release Aids

Mechanical release aids that replace the fingers in holding and releasing the bowstring have grown in use in recent decades. The three major types of mechanical releases are rope, solid (one-piece), and moving sections.



Use extreme care with mechanical releases. Scouting America recommends that mechanical release aids should be used *only* under the strict supervision of a qualified merit badge counselor.

Because the finger release is an important part of championship form, mechanical releases are not allowed in tournaments sanctioned by the World Archery Federation, based in Lausanne, Switzerland. These tournaments include the Olympics, world championships, and U.S. national championships.

Bow Slings

The best way to hold a bow is to hold it *without* wrapping your fingers around it. However, if you shoot this way the bow will jump out of your hand when you release the string. You will need a bow sling to keep the bow from falling to the ground. Different styles of bow slings can be bought or made, out of cord or leather. The two major types are the finger sling and the wrist sling.

Try the different styles of bow slings to see which one works best for you and needs no adjustment after each shot.



The finger sling attaches around the thumb and the index finger of the bow hand. You also can make a simple finger sling using a shoestring.

Wrist slings are either mounted on the bow and laid across the wrist, or looped around the wrist with an end going around the bow and hooked onto the loop on the inside of the wrist.



Option A: Recurve Bows and Longbows

Early archers used simple longbows and recurve bows. The first bows were made from a single piece of wood, and usually they had straight limbs. Where good bow wood was scarce, people learned to make composite bows from wood, horn, and sinew. These bows were often recurved, much like the one illustrated in this chapter.

You may select a single-piece bow, which does not come apart, or a takedown bow, which breaks into three sections: a handle riser and upper and lower **limbs**. Takedown bows are easier to store and more convenient for travel than single-piece bows. An archer who hunts and target-shoots can use the same handle riser with two sets of limbs, rather than use two separate bows for these pursuits.

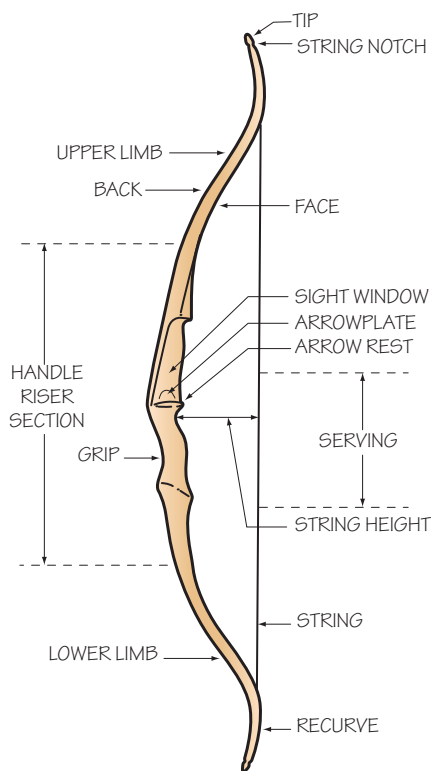
Whatever bow you choose, the two most important factors in selecting it are its draw weight and its length.

Draw Weight

Draw weight is the amount of force needed to pull the bowstring back the length of the arrow. That force is measured in pounds. For easy comparison, because arrows come in many lengths, draw weight is always measured with the bowstring drawn back a standard distance of 28 inches. The number of pounds it takes to pull the bowstring back that far is the bow's draw weight. A bow marked **33# at 28"** has a draw weight of 33 pounds. A bow's draw weight will be marked on its handle or lower limb.

The **limb** is the upper or lower part of the bow that bends when the bowstring is drawn. A beginner archer with a takedown bow only needs to buy new limbs—not a whole new bow—to improve gear.

If you decide to buy a takedown bow, make sure the limbs fit snugly and do not move at the points where they attach to the handle riser.



Shown are all of the parts of a modern recurve bow. Modern longbows have the same parts, except they have no recurve and may not have a sight window (the cutaway part of the bow above the handle).

Another kind of draw weight is called the *actual draw weight*. This is the amount of force you exert on the bowstring when you are shooting. Actual draw weight may vary from the draw weight marked on the bow, depending on the length of your draw. Determine your length of draw by holding the bow with an extended arm and drawing the bowstring back until the index finger is under the center of the chin. If your draw length is 28 inches, your actual draw weight is the same as the draw weight marked on your bow. If your draw length is less than 28 inches, your actual draw weight is less than the weight marked.

A good draw weight to start with is 20 or 25 pounds. This weight will allow you to learn and practice the skills of archery. Archery is not a test of strength, but of skill. If your bow is too heavy, you will have a hard time learning to shoot accurately. You should be able to pull and hold your bow at full draw 10 times for 5 to 10 seconds at a time without shaking or getting tired.

To determine the actual draw weight of your bow, add 2 pounds for every inch over 28 inches that you pull back your bowstring, or subtract 2 pounds for every inch under. For example: You have a bow marked **33# at 28"** (33 pounds at 28 inches), and your draw length is 26 inches. Your actual draw weight is 29 pounds: $33 - (2 \text{ inches} \times 2 \text{ pounds})$. An adult, if shooting the same bow with a draw length of 29 inches, would have an actual draw weight of $33 + (1 \text{ inch} \times 2 \text{ pounds})$, or 35 pounds.

Bow Length

Bow length is measured along the contour of the face of the bow (the side nearest the string) from limb tip to limb tip. The length is marked on the bow just below the draw weight. An example of a bow-length marking is “ATA 64 inch.” (ATA stands for Archery Trade Association, which sets standards for bow and string length.)

The length of the bow you choose will depend mainly on the type of shooting you will do. Generally, target bows are longer than those designed for hunting. Target bows typically are 60 to 70 inches long; hunting bows are 54 to 64 inches long. In general, the longer the bow, the smoother and more accurate the shot; the shorter the bow, the more arrow speed and ease of handling when hunting. A good bow length to start with is about 64 inches.

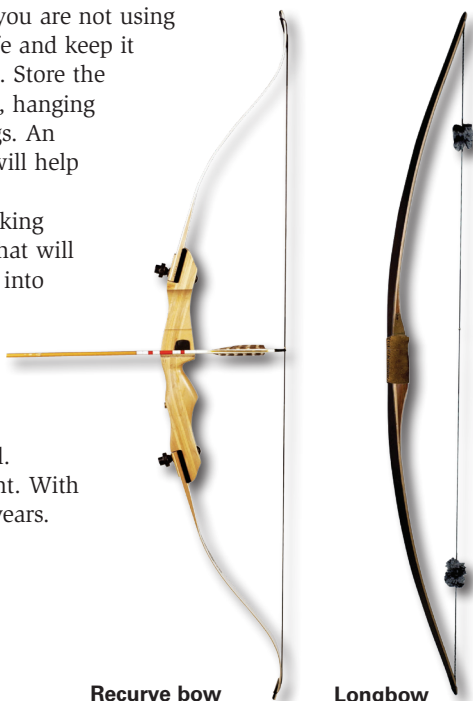
Caring for a Recurve Bow or Longbow

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.

After you learn the fundamentals of good shooting and you have practiced enough to strengthen your shooting muscles, you may choose to go to a heavier bow.



Recurve bow

Longbow

The Bowstring and Its Care

A **bow square** is a T-shaped device used to measure nocking height and string height.

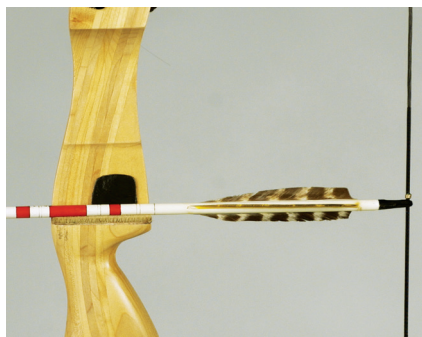
USA Archery advises beginners to use bowstrings made of Dacron with a *serving* (a wrapping of thread that protects the bowstring where the arrow is set) made of multifilament nylon thread. Get an expert to help you select a bowstring that is the right length and has the right number of strands for your bow.

You can determine your bowstring's nocking point with a **bow square**. Lay the shaft of your arrow on the arrow rest and find the point on the string that would place your arrow perpendicular (at a 90-degree angle) to the string.



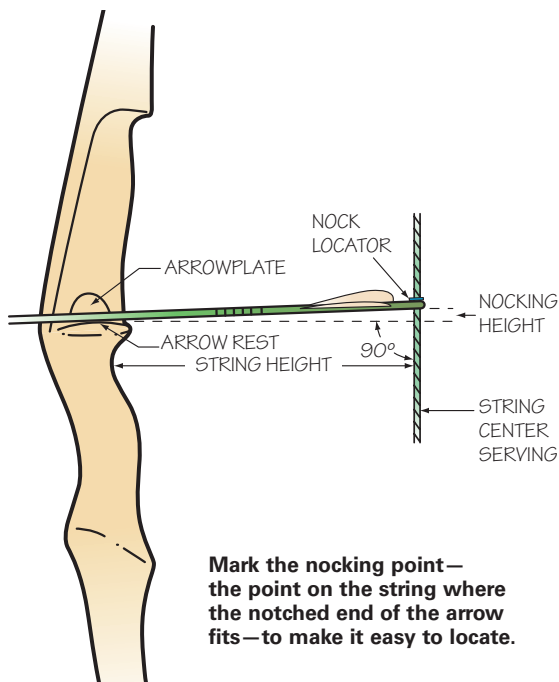
Always use a bow stringer when stringing your bow. Improper stringing or using step-through or push-pull methods can cause permanent damage.

Now measure $\frac{3}{8}$ inch up from the bottom of the arrow to find your correct nocking point. Mark this spot with serving thread, crimp-on nock locator, or even dental floss so you can find the exact location easily, every time.



Inspect the string carefully before and after each day's shooting. If any of the main strands are broken, replace the string. Check the serving and repair or replace it if it is loose or worn. The serving protects the string's delicate fibers from directly contacting the arrow nock and assures longer string life. Store the bowstring with your bow.

Keep your bowstring well-waxed with either a commercial bowstring wax or a wax you can make yourself using one part resin to three parts beeswax.

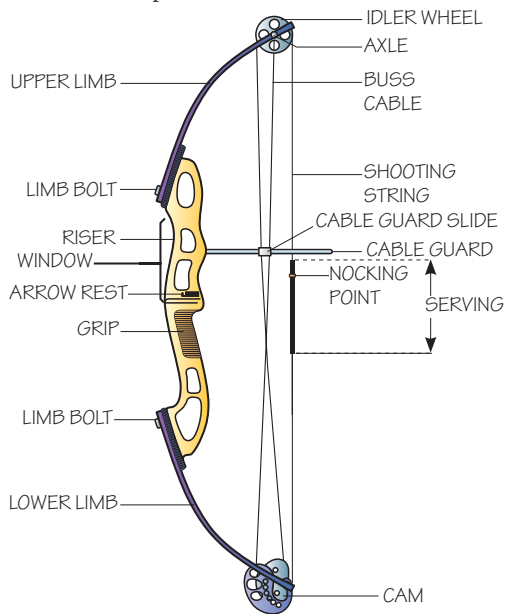




Option B: Compound Bows

The compound bow is the only fundamental improvement in bow technology since prehistoric times. The advantage of the compound bow is that the variation in draw weight as the bow is drawn can be modified from the ever-increasing draw weight variation of the recurve or longbow. This mechanical advantage is accomplished with two cams or eccentrics and a cable that passes over them, as shown. At full draw, compound bows normally have a draw weight that is less than its maximum draw weight at partial draw.

For example, a bow that reaches its maximum draw weight of 50 pounds at three-quarter draw might have a full draw weight of only 25 pounds. Some compound bows have a full draw weight of as little as 20 percent of the maximum. That is, they have an 80 percent *let-off*.



Parts of a modern compound bow

Tip: To avoid dryfiring, it is best to always have an arrow on the string when shooting a bow. Dryfiring, or shooting a bow without an arrow, can seriously damage a bow and possibly injure the archer.

H. Wilbur Allen patented the compound bow in 1969.

Another characteristic of a compound bow is that when the bowstring is drawn to the bow's preset draw length, the bow cannot be drawn any further. This means your bow must be adjusted to your draw length. Most compound bows have a limited range of draw-length adjustments. A knowledgeable adult should make the adjustments.

You may select a single-cam bow or a two-cam bow. The single-cam bow will have an idler wheel at one end of the bow and the cam at the other end, as shown. A two-cam bow will have cams at both ends. Both types perform well. Your choice will depend on your preferences. Try both types before you decide which kind you want.

Whatever bow you choose, the two most important factors in selecting it are its draw weights (both maximum and at full draw) and its length.

Draw Weights

Draw weight is the amount of force needed to pull back the bowstring. That force is measured in pounds. A compound bow has two draw weights—the maximum draw weight and the weight at full draw. Most good compound bows have adjustable draw weights.

The maximum draw weight, the factory-set draw length, and the ATA bowstring length usually are marked on the face of the lower limb. (ATA stands for Archery Trade Association, which sets standards for bow weight and bow and string length.) For example, a compound bow might be marked **50# at 29"**, and **28" bowstring**. That bow can be adjusted to have a maximum draw weight of 50 pounds; it has a draw length of 29 inches as it comes from the factory box; and it requires a 28-inch bowstring. The maximum draw weight and draw length could be adjusted to fit your needs, but the string length will always be 28 inches.



A good maximum draw weight to start with is about 35 pounds with a full draw weight of about 20 pounds. This weight will allow you to learn and practice the skills of archery. Archery is not a test of strength, but of skill. If your bow is too hard to pull, you will have a hard time learning to shoot accurately. You should be able to pull and hold your bow at full draw 10 times for 5 to 10 seconds at a time without shaking or getting tired. After you learn the fundamentals of good shooting and you have strengthened your shooting muscles with practice, you may choose to increase the maximum and full draw weights of your bow.

Bow Length

The length of a compound bow is measured from the axle of the cam or idler on the upper limb to the axle of the cam on the lower limb. An example of a bow length is “ATA 34 inch.”



Bows usually are stored hanging by the riser in a horizontal position in a cool, dry place. Do not subject a bow to excessive heat. The high temperatures reached in a truck or car left in the sun can damage any bow.

The length of the bow you choose will depend mainly on the type of shooting you will do. Generally, target bows are longer than those designed for hunting. Compound bows for target-shooting are typically 38 to 44 inches long; hunting bows are 32 to 38 inches long. In general, the longer the bow, the smoother and more accurate the shot; the shorter the bow, the more arrow speed and ease of handling when hunting. For a compound bow, a good length to start with is 36 or 38 inches.

Caring 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.

The Bowstring and Cables and Their Care

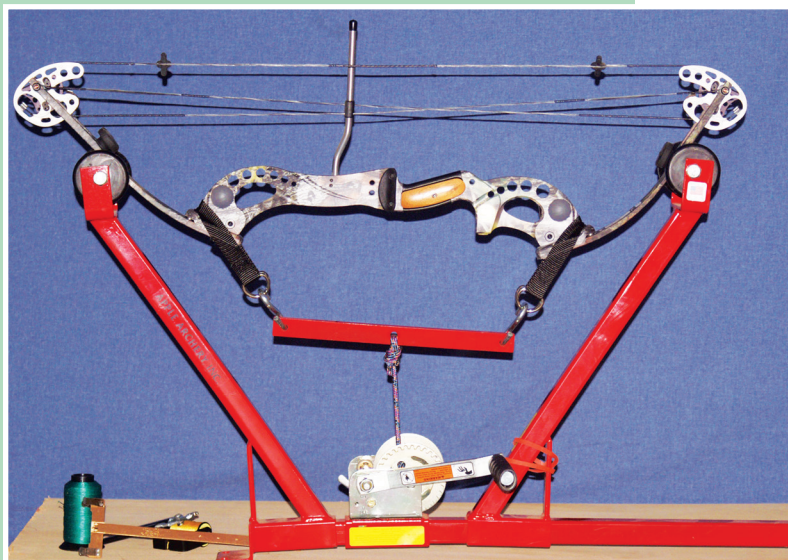
Determine your bowstring's nocking point—the spot where you fit the notched end of the arrow—using a **bow square**. Lay the shaft of your arrow on the arrow rest and find the point on the string that would place your arrow perpendicular (at a 90-degree angle) to the string. Now measure $\frac{3}{8}$ inch up from the bottom of the arrow to find your correct nocking point. Mark this spot with serving thread or crimp-on nock locator, or even dental floss so you can easily find the exact location every time.

Keep your bowstring and nonmetal cables well-waxed with a commercial silicon-based 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.

A **bow square** is a T-shaped device used to measure nocking height and string height.

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.



Replacing the string and most other repairs and adjustments made on a compound bow require that the tension on the string and cables be relieved. A special compound bow press holds the bow and allows the limbs to flex without pulling the string. This is the only safe and convenient method that will not damage the bow. Only a knowledgeable, professional bowyer should repair and adjust the bow.

A **bowyer** is someone who makes or services bows.



Shooting a Bow and Arrow

A bow is not ready for action until it is braced (strung). If you are shooting a recurve bow or longbow, use a stringer to string your bow each time. The photos show the proper ways to string straight and recurve bows. Improper stringing can damage or twist a bow's limbs.

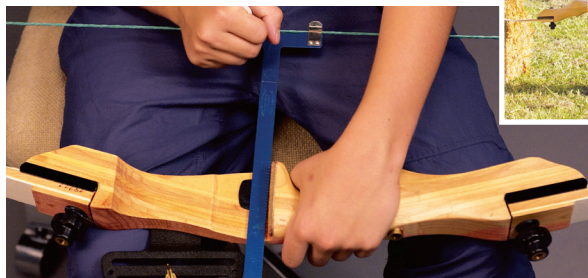
When you string your bow, also check the *string height* (*fistmele*). The string height is the distance between the handle and the string when the bow is strung. The manufacturer sets the correct string height. On most modern bows, it is from 7 to 9 inches (18 to 23 centimeters). If your bowstring is too short, the string height will be too great and the bow limbs will be under too much strain. If the bowstring is too long, the string height will be too little and the string may give you a lot of arm and wrist slap.



String stringer



Rope stringer



Before you begin shooting, sight down your bow's limbs. The string should go straight down the middle of both limbs. If your bow has a twisted limb, let an experienced adult archer fix it.

If you are shooting a compound bow, check that the cables are in good condition and are riding properly in the grooves of the cams and wheels. Also check that the tiller for both upper and lower limbs is proper. *Tiller* is the distance to the bowstring from the joint where the limb meets the riser. If your bow does not have the proper tiller, let an experienced adult archer fix it.

Steps of Shooting

Shooting a bow has 11 basic steps: stance, nock, hook and grip, posture/alignment, raise bow, draw, anchor, transfer to hold, aim, release/follow-through, and feedback.



Stance

The techniques described here are for right-handed archers. Left-handed archers should reverse body positions.

Step 1: Stance

Your stance is the position you assume when you shoot. For target shooting, position your body parallel to the flight of the arrow, with your left side toward the target. Stand comfortably, keeping your feet about shoulders' width apart. Touch your toes to an imaginary line leading to the center of the target. If you were to lay an arrow on the ground against your toes, it would point to the target. Stand up straight and keep your weight evenly balanced on both feet. Relax your shoulders. Look directly at the target.

Step 2: Nock

Nocking the arrow means placing the arrow on the string and the bow. With your right hand, lay the shaft of the arrow on the arrow rest. Nock the arrow (fit its notched end onto the string) at the proper nocking point, just below and touching the nock locator. Be sure the index (odd-colored) feather is facing away from the bow.



Nock

Step 3: Hook and Grip

Keep your shoulders level. Set your left hand (if you are right-handed) comfortably in the handle of the bow. Lightly hold the bow with its weight against the base of your thumb. Center the bow's pressure in the Y formed by your thumb and index finger. Avoid an overly tight grip on the bow handle because a

tight grip chokes the bow's natural action.

Place three fingers of your right hand on the bowstring, index finger above the arrow and middle two fingers below it. The string should rest in the first joint of all three fingers. Your right hand is now forming a hook on the bowstring.



Hook and grip



**Posture/
Alignment**

Step 6: Draw

Extending your left arm fully and keeping your left shoulder down, begin to draw the bowstring with your right hand. Keep your right hand and elbow at shoulder level. Your right forearm becomes a straight-line extension of the arrow. Use your strong back muscles to draw the bow, concentrating on smoothly and steadily moving your elbow straight back. Be sure to draw your bow the same length each time.

Step 4: Posture/Alignment (Set)

Keeping your shoulder down, raise your left arm and the bow until the arrow is pointed directly at the target. At the same time, rotate your left elbow downward so it will not be in the way of the string when you release. Your left hand lightly holds the handle of the bow. The elbow of your drawing arm should be near the level of your nose.

Step 5: Raise Bow (Set-Up)

Lift both arms up from the ground and keep the bow arm extended. Stop when the bow hand is at shoulder height.



Draw



Under-the-chin anchor

Step 7: Anchor

The *anchor point* is where the archer's hand and bowstring touch the face at full draw. It is essential that you use the same anchor point for every shot. The anchor point serves as the rear sight.

To anchor, settle the index finger of the draw hand in the corner of the mouth. Keep the draw hand relaxed and up against the face.

A sloppy anchor is the same as a loose sight.



Side-of-the-face anchor

Step 8: Transfer to Hold

At full draw, transfer the weight of the bow from your arms and shoulders to your back. Bring your elbow directly behind the arrow. Use your back muscles to help hold this position.

Step 9: Aim

Two basic methods are used for aiming a bow: *bow sight* and *point of aim*. The bow-sight method is more accurate and easier to learn.

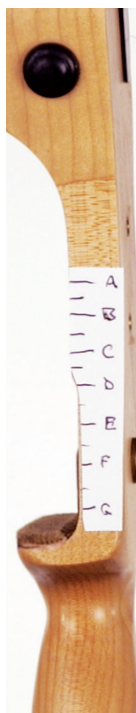
Whatever method of aiming you use, be sure to *hold* until you are sure of a good shot. Snap shooting—releasing too quickly—does not allow you to aim properly and can be difficult to overcome later if it becomes a habit now. Take your time, aim well, then shoot.

BOW SIGHT

Bow sights of all kinds are available. Some are simple pins, while others are complex sights for advanced target competition. All sights work the same way. Their only difference is that some are more easily adjustable for different distances.

To start, try a simple pin or target-type sight. You can make your own. Place a strip of foam tape on the back of your bow above the handle. Then put a round-headed pin (the kind with a glass or enamel bead head) in the tape so that the head is visible on the arrow side of the bow.

To establish a sight for 10 yards, put the pin in the tape about 5 inches above the handle, with the pinhead sticking out to the left of the bow about $\frac{1}{4}$ inch. Choose a small (1-inch) aiming spot on your target, 10 yards away. With the arrow fully drawn and anchored, raise or lower the bow so that the pinhead is in line with the right eye and the aiming spot, and release the arrow. Shoot three to six arrows in the same way and see where they group. If all arrows hit the aiming spot, you have established the 10-yard sight. If the arrows group a little high, move the pin up a bit. Adjust the sight until the arrows consistently hit at or near the spot. Mark the 10-yard sight on the strip of tape.



**Homemade
bow sight**

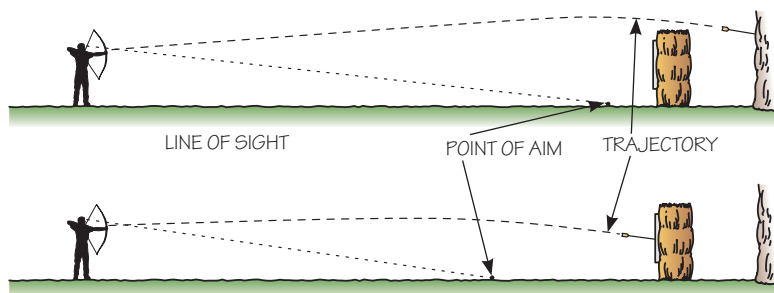


After you have established the 10-yard sight, stand 20 yards from your target and try to locate the 20-yard sight. To start, move the pin down about $\frac{1}{8}$ inch below the 10-yard sight and try it. You should be close. For the 30-yard sight, move the pin about $\frac{1}{4}$ inch below the 20-yard sight. The 40-yard sight will then be nearly $\frac{1}{2}$ inch below the 30-yard sight.

To shoot well with a bow sight, you must learn to come to full draw and hold the sight pin dead-center on the target. Make sure your anchor is solid. Once at full draw, look

past the string and you will see the sight pin and the target. One or the other will be out of focus. It does not matter which one is in focus; concentrate on the one with which you feel most comfortable. When the arrow is fully drawn and anchored, and the sight is steady on the bull's-eye, release the arrow. (See "Release" later in this chapter.)

At full draw, the archer looks over the tip of the arrow at a marker in front of the target. In the illustration, the point of aim is too far from the archer; the arrow misses the target completely. By moving the marker and changing the point of aim, the archer can arrive at an accurate trajectory.



Some archers use a strip of tape with distances marked on it. By trial and error, as described in this section, they have figured out where to move their sight pin in that tape to shoot a specific distance. Homemade sights work as well as store-bought sights; the adjustments just are not as precise.

Cast is the distance a bow can shoot an arrow. If you fish, you know that a throw of a fishing line or net is also a cast.

POINT OF AIM

The point-of-aim method requires the archer to rely on instinct. The archer looks down the arrow shaft to a spot on the ground in front of the target called the *point of aim*. Usually, the point of aim is a rock, a piece of paper, light-colored plastic, or other marker. In effect, the archer uses the point of the arrow as a sight. If the arrow misses the target, the point-of-aim marker is moved, forward or back, until the arrow strikes the target center. (See the illustration.)

Thanks to modern technology and an open philosophy that archery is a sport for just about anyone, thousands of people with disabilities are able to participate in archery both competitively and for fun. Archery equipment manufacturers have developed gear especially for archers with special needs. A number of organizations and facilities actively support and promote archery for people with disabilities. In addition, to help equalize competition among archers with disabilities, multiple categories of competition have been developed. Serious archers are able to compete at the elite level, as well. In fact, since 1996, the World Archery Federation (which governs international rounds and coordinates archery in the Olympics) has actively pursued the establishment of competition rules for archers with special needs.

Step 10: Release and Follow-Through

Releasing is simply a matter of relaxing the fingers that hold the string while you maintain the tension in your back. When your draw fingers relax, the string will escape, and the arrow will be on its way.

As you release, maintain your good shooting form and keep your eyes on the target. Try to move as little as possible. Some people wait until the arrow hits the target before they relax. Movement during the follow-through can cause an otherwise good shot to miss the mark. In a good follow-through, your right hand will be at the back of your neck, and your bow arm will still be lined up perfectly with the target.



Release and follow-through

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 bull's-eye.



Step 11: Feedback

Evaluate your shot process to see how you may improve for the next shot.



Archery Games and Tournaments

An archery tournament has one or more rounds. In each round, archers shoot a series of arrows at specified distances and target faces.



Archery tournaments can last from a few hours to several days.

Competitive archery has three styles: target, field, and 3-D.

Target archery is shot on a large, open field with multi-colored target faces. This is the type of archery shot in the Olympics and Paralympics.

Field archery is shot on a roving course. Archers shoot at different angles and distances, moving through woods and fields as if in search of wild game.

3-D archery also is shot on a roving course, but the targets are molded foam replicas of game animals. Field and 3-D archery are good practice for bow hunting.

Field Archery and Target Archery

Field archery is set up on a course or roving range similar to the field archery plan shown later in this chapter. Different target faces and shooting distances are used for 14 targets. Stakes driven into the ground mark the exact shooting spot for each target. The archer stands behind the stakes to shoot.

Outdoor target archery is set up in an open field, using 122-centimeter (48-inch) target faces. In most cases, the target position is set and the shooting line is moved when different distances are shot. The longest distances are shot first.

Indoor target archery is shot in a building, using 60- or 40-centimeter targets at a distance of 18 meters (20 yards). Target archers straddle the firing line, with one foot in front of and one foot behind the line.

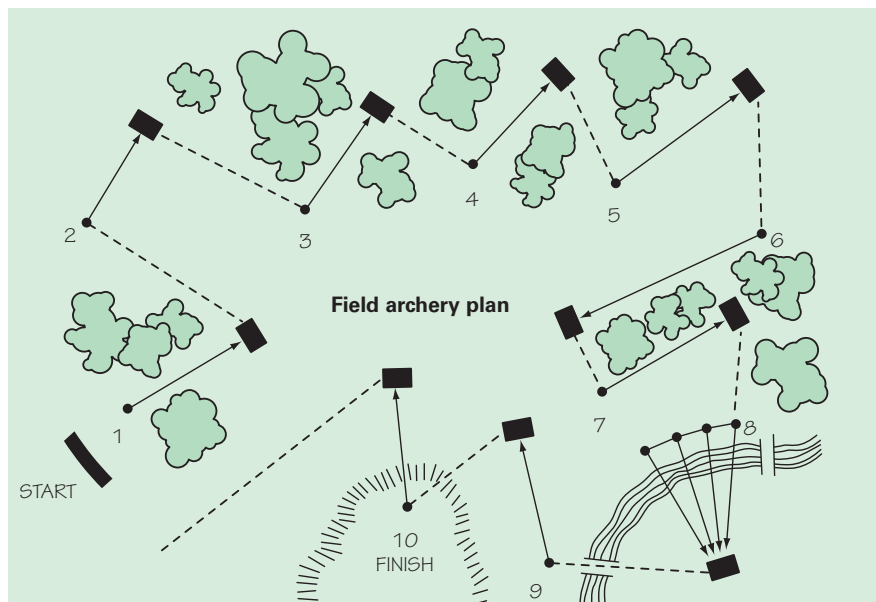
These four organizations govern archery tournaments. See the resources section for ways to contact them.

USA Archery—Governs American target archery rounds and approves international target and field rounds for Americans in Olympic and World Archery competitions. It is responsible for selecting and training men's and women's teams to represent the U.S. in the Olympic, Paralympic, and other international competitions.

National Field Archery Association—Governs American field archery rounds for amateur and professional competition. The NFAA is a member of the International Field Archery Association.

World Archery Federation—Based in Switzerland, governs international rounds and coordinates archery in the Olympics and Paralympics.

International Bowhunting Organization—Governs 3-D rounds.



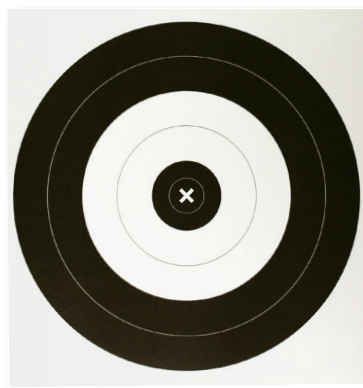
Field Archery Rounds

The NFAA's field, hunter, and animal rounds; Scouting America's Scout field round; and the International Bowhunting Organization (IBO) 3-D round all are field rounds.

FIELD ROUND (NFAA)

The field round, originally developed to give archers a way to practice bow hunting, has become as much a game as it is hunting practice. The course is set up in the woods, using 14 targets that vary in size from 20 centimeters (8 inches) to 65 centimeters (26 inches).

Archers shoot four arrows at each target. For 11 of the targets, the four arrows are shot from the same position, but distances vary for different targets. Distances and target sizes are listed in the chart, "Target Sizes and Shooting Distances for the NFAA and Scout Field Rounds."



NFAA field target

Shooting positions are marked with white stakes. They do not follow in any special order and may be arranged as best suits the terrain.

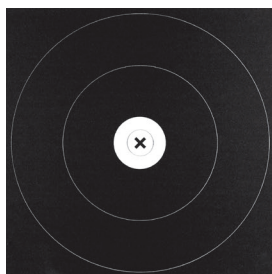
The targets have five scoring rings. The black center or spot is one-fifth the outer diameter of the target and has an inner circle half the diameter of the spot. The inner circle is used in breaking tied scores. Standard field-round scoring is 5 points for the black bull's-eye or spot, 4 points for the two white areas, and 3 points for the two outer black areas. Championship scoring uses all five rings with scores from 5 to 1.

SCOUT FIELD ROUND (SCOUTING AMERICA)

The Scout field round is an adaptation of the NFAA field round for Boy Scout camps. The targets and scoring are the same as for the NFAA field round. However, the distances to be shot are different so that less space is required.

HUNTER'S ROUND (NFAA)

The hunter's round is designed to give the archer practice in concentrating on the target area. The target is all black, with lighter lines marking the five scoring areas. Shooting distances are slightly less than in the field round, but the same course is used, with red stakes marking the shooting positions. Archers must change positions for each shot in a hunter's round.



Scoring is the same as in a field round: 5 points for the bull's-eye or spot, 4 points for the next two rings, and 3 points for the two outer rings.

ANIMAL ROUND (NFAA)

The animal round, designed for bow hunting practice, is laid out on the same course as the field and hunter's rounds. However, animal target faces are used instead of circular black-and-white targets. Targets have two scoring areas, the "vital" and "nonvital" areas. Three arrows may be used for each target. The first arrow to hit scores; any remaining arrows are not scored. Thus, if the first arrow hits the target, the second and third arrows are not scored. Scoring is shown in the chart.

Target Sizes and Shooting Distances for the NFAA and Scout Field Rounds

NFAA Field Round		Scout Field Round	
Distances	Target Size	Distance	Target Size
Yards	Centimeters	Yards	Centimeters
80-70-60-50	65	7	20
65	65	11	35
60	65	15	50
55	65	20	65
50	50	12	35
45-40-35-30	50	16	50
45	50	21	65
40	50	13	35
35-35-35-35	50	17	50
30	35	22	65
25	35	14	35
20	35	18	50
15	35	23	65
35-30-25-20 ft.	20	19	50

Animal Round Scoring

HITS	VITAL AREA	NONVITAL AREA
First arrow	20 points	18 points
Second arrow	16 points	14 points
Third arrow	12 points	10 points

THREE-DIMENSIONAL (3-D) ROUND (IBO)

The 3-D round also is designed for bow hunting practice. It is laid out on the same type of 14-target course used for the field and hunter's rounds. However, the targets are three-dimensional replicas of animals, and distances are unmarked. Targets have three scoring areas: the circle within the vital area (10 points), the vital area (8 points), and the rest of the body (5 points). Only one arrow may be shot at each target.

Target Archery Rounds

Target archery rounds may be shot indoors or outdoors and are typically shot at a distance of 18 meters indoors and between 30 and 70 meters outdoors. Outdoor distances are assigned based on age category and bow type (recurve, compound or barebow).

For more information about target archery scoring visit usarchery.org.

900 ROUND (USA ARCHERY)

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 the center out, is 10-9-8-7-6-5-4-3-2-1. The distances and numbers of arrows shot (for a total possible or perfect score of 900) are

30 arrows at 60 meters

30 arrows at 50 meters

30 arrows at 40 meters

Shooting is in ends of six arrows. This means the score is checked and arrows are recovered after each six arrows have been shot.



WORLD ARCHERY INDOOR ROUND I (WORLD ARCHERY FEDERATION)

A 40-centimeter five-color target face is used, with 10-ring scoring: 10-9-8-7-6-5-4-3-2-1. Thirty arrows are shot at 18 meters. Shooting is in ends of three arrows.

WORLD ARCHERY INDOOR ROUND II (WORLD ARCHERY FEDERATION)

This is similar to World Archery Round I, with 30 arrows shot. But, the distance is 25 meters and the target has a 60-centimeter face. Shooting is in ends of three arrows.

NFAA INDOOR 300 ROUND

The 300 round consists of 60 arrows shot in 12 five-arrow ends. (The score is marked and arrows are recovered after each five arrows have been shot.) The round is shot at a 40-centimeter blue NFAA target from 20 yards. Scoring, from the center out, is 5, 4, 3, 2, and 1, with a total possible score of 300.

JUNIOR OLYMPIC ARCHERY DEVELOPMENT (USA ARCHERY)

USA Archery's youth archery training program, Junior Olympic Archery Development (JOAD), classifies young archers by their scores. The ratings are Yeoman, Junior Bowman, Bowman, Junior Archer, Archer, Master Archer, Expert Archer, and Olympian.

Outdoor shooting distances are 15, 20, 25, 30, 40, 60, and 70 meters. Outdoor qualifying rounds are shot in ends of six arrows at five-color 122-centimeter (48-inch) targets.

The indoor distance is 18 meters (20 yards). Qualifying rounds are shot in ends of six arrows at 60-centimeter (24-inch) faces. Progressively higher scores are required for advancement.

All JOAD

qualifying rounds
use the five-color
target with
10-ring scoring.

Scoring USA Archery and NFAA Targets

Here are two typical archery scorecards.

The number of hits and the score for each end are recorded. The total number of hits and total score are determined by adding the results of each end.

INDOOR SCORECARD					CLUB LOGO	
CLUB NAME						
NAME: _____						
EVENT: _____						
DATE: ____/____/____						
GENDER:		MALE		FEMALE		
CLASS:		SENIOR		BARBOW MASTER		
		MASTER		MASTER		
		JUNIOR		CADET		
		BOWMAN		COLLEGIATE		
				CUB		
				PARA		
DIVISION:		RECURVE		COMPOUND		
		BARBOW		BOWMASTER		
		RECURVE		COMPOUND		
END	1	2	3	End Score	End Score	10's 9's
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
TOTALS:						
ARCHER SIGNATURE: _____ SCORER SIGNATURE: _____						
SCORE SUMMARY						
TOTAL	Score	10's	9's			

OUTDOOR SCORECARD					CLUB LOGO	
CLUB NAME						
NAME: _____						
EVENT: _____						
DATE: ____/____/____						
GENDER:		MALE		FEMALE		
CLASS:		SENIOR		BARBOW MASTER		
		MASTER		MASTER		
		JUNIOR		CADET		
		BOWMAN		COLLEGIATE		
				CUB		
				PARA		
DIVISION:		RECURVE		COMPOUND		
		BARBOW		BOWMASTER		
		RECURVE		COMPOUND		
OUTDOOR SCORING ROUND						
END	1	2	3	End Score	End Score	10's 9's
1						
2						
3						
4						
5						
6						
TOTALS:						
ARCHER SIGNATURE: _____ SCORER SIGNATURE: _____						
SCORE SUMMARY						
TOTAL	Score	10's+X's	X's			

Olympic and world archery titles are governed by the World Archery Federation. The federation is responsible for setting the rules and regulations for international archery events.

Barebow vs. Freestyle

Archers shooting **barebow** style may not use sights or other shooting aids. No mechanical release devices are allowed; only fingers, tabs, or gloves.

Archers shooting **freestyle** may use approved shooting aids. In target archery, freestyle permits stabilizers and pin sights but does not allow release aids or optical sights. In field archery, freestyle allows stabilizers, release aids, and optical sights.

National, International, Olympic and Paralympic Games Events

After you have earned the Archery merit badge, you might want to try your skills in a tournament. Local clubs put on tournaments for both target and field shooters.

You might even set your sights on national, international, or Olympic archery tournaments, where the number of arrows and the distance from the target vary by the nature of the event. For example, indoor archery competitions require 36 arrow rounds and outdoor competitions require 72 arrow rounds. At indoor competitions, arrows are usually shot from a distance of 18 meters at a 40-centimeter (16-inch) target face. Arrows at outdoor competitions may be shot from 70 meters away at a 40-centimeter triple target.

The target faces have five color zones—gold, red, blue, black, and white. A scoring line divides each zone into two areas, making a total of 10 scoring zones. These zones are worth from 10 points (for the center) to 1 point (the outer ring).

The number of competitors varies according to the type, or “discipline,” of the archery competition. For example, at the World Archery Championships, 104 athletes begin the competition but, for the finals, only the top eight athletes compete.



Archery Terms

anchor point. The point on an archer's face that the index finger or drawing hand touches during holding and aiming.

arm guard. A piece of leather or other material worn on the arm that holds the bow to protect the forearm from being slapped by the bowstring.

arrowplate. Material glued to the side of the bow where the arrow contacts it. The plate protects the bow from the friction of the arrow. Some modern bows have adjustable arrowplates to help tune the bow precisely.

arrow rest. A small protrusion on the bow where the arrow rests during the draw.

axle. The shaft around which a cam or idler wheel of a compound bow rotates.

back. The outer side of the bow, farthest away from the string.

barbs. The two sharp points of an arrowhead that project backward.

bow arm. The arm that holds the bow while shooting.

bow sight. A sighting device attached to a bow.

bowstring wax. A silicon or beeswax-based material used to lubricate bowstrings and to keep them from fraying.

bow weight. See **draw weight**.

brace. To string a bow.

broadhead. A hunting point with two or more cutting edges.

buss cable. The cable on a compound bow that goes around the cams and wheels. Cables can be made of stainless steel or a special bowmaker's fiber.

butt. Any material designed to stop arrows. A target face is pinned on the butt.

cable guard. A steel rod mounted to a compound bow riser to keep the buss cable from interfering with the arrow.

cable guard slide. A plastic slide that holds the buss cable onto the cable guard. It slides on the cable guard to allow the buss cable to move away from the riser as the bow is drawn.

cam. The wheel-like device at the end of a compound bow limb that causes the draw weight to peak and then fall off as full draw is achieved.

cast. The distance a bow can shoot an arrow.

creep. To let the arrow move forward after reaching full draw, but before release. Creep is caused by a loss of back tension.

crest. Bands of color decoration on an arrow, used for identification.

crossbow. A bow designed to be shot similarly to a gun, with a groove or barrel that directs the arrow and a trigger that releases the string.

draw. The act of pulling back the bowstring.

draw length. The length of your full draw; the distance at which the arrow is drawn back before it is released.

draw weight. The amount of pull, measured in pounds, needed to draw an arrow back to an archer's full draw length. For easy comparison of recurve bows and longbows, draw weight is always measured with the bowstring drawn back a standard distance of 28 inches. The draw weight of a compound bow is the pounds of pull needed to hold the bow at the draw length at which the bow is set.

Also see **maximum draw weight.**

drawing arm. The arm that draws the bowstring.

face. The scoring surface on a target. The face is usually made of paper, but other materials such as thin plastics and plasticized paper are in common use. Also, the side of the bow nearest the string.

finger sling. A strap attached to the thumb and index finger of the bow hand and used to keep the bow from falling after an arrow's release.

fistmele. The traditional term for **string height**. Fistmele was measured by placing the fist on the bow handle and raising the thumb toward the string. This method of measurement is not applicable to most modern bows.

fletch. To put feathers or plastic vanes on the arrow near its nock.

fletcher. One who puts feathers or vanes on an arrow. Also a term for the jig used to place feathers on the arrow when cementing them to the shaft.

flight arrow. A light arrow used in shooting for distance.

flight bow. A bow designed for maximum cast with little consideration for accuracy.

flu-flu. An arrow used to shoot aerial disc targets or hunting birds. It has very large feathers that slow it rapidly after the first 30 yards and cause it to drop quickly.

glove. Three leather fingers held with a wrist strap on the first three fingers of the release hand. The glove protects the archer's fingers.

handle. The rigid center portion of the bow that is held during shooting.

head. The point or tip of the arrow.

hit. To strike the target for a score.

holding. Keeping an arrow at full draw while aiming.

index feather. The feather that is perpendicular to the bow during the draw; usually the odd-colored feather.

instinctive shooting. Shooting without the aid of a sighting device or a point of aim.

kisser button (kisser). A marker placed on the bowstring so it touches the archer's lips when the archer is at full draw. The kisser helps establish a better anchor point.

let down. To slowly release tension from full draw without releasing the arrow.

limb bolt. The bolt used to attach the limbs to the riser.

limb socket. A section at the end of a riser that is made to hold the limbs in place. Limb sockets are used on takedown recurve bows and compound bows.

longbow. A straight bow that has only one curve when strung.

maximum draw weight. The peak draw weight of a compound bow. Maximum draw weight usually is reached at about 75 percent of full draw.

nocking point. The point on the bowstring where the notched end of the arrow (the nock) is fitted. The nocking point is often marked by extra serving or nock locators.

nock locator. An attachment to the center serving of a bowstring used to mark the nocking point. The nock locator may be a metal crimp-on, a piece of plastic that shrinks to fit, or an additional serving.

overbowed. Equipped with too strong a bow.

overdraw. To draw an arrow so far that the point passes the face of the bow.

perfect end. In target archery, six arrows shot consecutively into the gold zone.

point of aim. A method of aiming in which the archer sights down the arrow shaft at a marker, usually an object on the ground, to try to hit the target. Also, the object used as the marker.

range. Distance to be shot; or a shooting ground, indoors or out.

riser. The handle part of a compound bow.

round. A series of arrows shot at specified target faces at set distances.

roving. Shooting at random objects at unknown distances.

serving. A wrapping of thread around the bowstring to protect it where the arrow is nocked and where the loops fit in the bow's string grooves.

shooting line. A line at a specified distance from the target. In field archery, the shooter stands behind the shooting line; in target archery, the shooter straddles the line.

sight pin. An indicator an archer puts on the bow to use as an aid in aiming.

sight window. The cutaway section of the bow above its handle.

spine. The stiffness of an arrow shaft relative to its thickness, weight, and length.

stabilizer. A weighted rod screwed into the bow to help steady it and reduce undesirable twisting of the bow and bowstring.

string fingers. The three fingers used to draw the bowstring.

string grooves. The two ends of the bow where the bowstring is fitted. Also known as string nocks or string notches.

string height. The distance between the bow's handle and bowstring when the bow is strung. String height is set by the manufacturer and usually is from 7 to 9 inches.

strung bow. A bow that is ready for shooting; also called a braced bow.

tab. A flat piece of leather or plastic worn on the drawing hand to protect the fingers when drawing the string and to ensure a smooth release.

tackle. Any or all of an archer's equipment.

tassel. A large piece of yarn worn on the archer's belt and used to wipe arrows clean.

tiller. The distance to the bowstring from the joint of the limb and riser of a compound bow. A well-tuned bow will have the same tiller for both upper and lower limbs.

torque. An undesirable twisting of the bow or bowstring on release.

toxophilite. An archer or one who is interested in all aspects of archery, including its history.

trajectory. The path of the arrow in flight.

vanes. The feathers or plastic substitutes that act as rudders in steering the arrow.

wand. A slat 2 inches wide and 6 feet high, shot at from a distance of 100 yards. The wand shoot is a holdover from medieval competitions.

weight of bow. *See* draw weight.

wheel. A round cam. The wheel may be an eccentric with its axle off-center or an idler wheel with the axle in the center.

wrist sling. A strap attached to the bow and the wrist of the archer's bow hand, used to keep the bow from falling after an arrow's release.



Archery Resources

Scouting Literature

Archery, Rifle Shooting, and Shotgun Shooting merit badge pamphlets; *Guide to Safe Scouting*; *Scouting America National Range and Target Activities Manual*.

With your parent or guardian's permission, visit Scouting America's official retail site, **scoutshop.org**, for a complete list of merit badge pamphlets and other helpful Scouting materials and supplies.

Books and Videos

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Organizations and Websites

International Bowhunting Organization

Telephone: 440-967-2137
iboarchery.com

National Field Archery Association

Telephone: 605-260-9279
nfaausa.com

USA Archery

210 USA Cycling Point, Suite 130
Colorado Springs, CO 80919
Telephone: 719-866-4576
usarchery.org

World Archery Federation

Maison du Sport International
Avenue de Rhodanie 54
1007 Lausanne
Switzerland
worldarchery.sport

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