

# ARCHERY EQUIPMENT

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

## Lesson 1: Introduction to Bowhunting

In this lesson you will:

- Recognize the history of archery.
- Recognize bowhunting offers a unique hunting experience.

### Brief History of Bowhunting



*For thousands of years, people have hunted with bows and arrows.*

The bow was an essential hunting tool until firearms were invented in Europe during the 14th Century. From that point until early in the 20th century, interest in bowhunting decreased greatly. By the late 1800s, no one other than tribal people living in remote areas of the world hunted with bows. The knowledge and skills for making bows and hunting game with them disappeared when these people passed away or adopted the customs of modern society. All that remained of archery was target shooting.

Then, on August 29, 1911, Ishi, the last Yana Indian raised without influence of white people, wandered into Oroville, California. He was about 50 years old, starving and emaciated. Dr. Saxton Pope, a physician at the



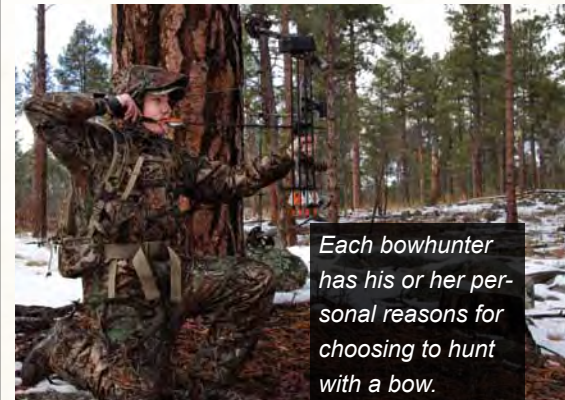
*Ishi's teachings in the early 1900s renewed interest in bowhunting.*

University of California, befriended and treated him. Ishi passed along his bowhunting skills, including how to make bows and arrows, to Dr. Pope, Arthur Young and Will Compton. Later, these three men demonstrated to the world the bow and arrow could be used to hunt big game.

Though Ishi died of tuberculosis in 1916, he launched the discovery of modern bowhunting. Interest in hunting with bow and arrow grew rapidly. In 1934, Wisconsin held the first bowhunting season in the United States. Today, it is a popular and legal method of hunting wild game in all states and provinces.

### Why Hunt with a Bow?

Hunting with a bow and arrow is unique because it provides close encounters with wildlife and requires refined hunting skills. Typically there are fewer hunters in



*Each bowhunter has his or her personal reasons for choosing to hunt with a bow.*

the woods during archery seasons. That can mean more opportunities to see wildlife and a more enjoyable hunt.

Here are some reasons why people enjoy hunting with a bow.

1. Feeling the satisfaction of spending time outdoors and being a part of nature
2. Enjoying the hunt in a traditional way using simple hunting tools invented thousands of years ago
3. Appreciating the challenges of bowhunting and developing skills to become more accurate
4. Studying wildlife behavior and preferred habitats, so the pursuit of wild game has greater meaning and value

This chapter is an introduction to bowhunting. Check the regulations for the state or province you plan to hunt in to know the educational and skill requirements for hunting with a bow.

## Lesson 2: Parts of a Bow

In this lesson you will:

- Identify the different parts of the bow.
- Determine how a bow works.
- Identify the different types of bows.

### Parts of the Bow

All bows have two main parts:

- Limbs: extensions from the mid-section or handle of the bow; they store energy when the bowstring is pulled.
- String or bowstring: a cord made of natural or synthetic fiber, both ends of which are attached to the limbs.

Additional parts for the bow include the following:

- Arrow rest: a device that holds the arrow on the riser or handle until the bowstring is released.
- Riser: rigid center section of the bow, also known as the handle,

which may be padded with leather (traditional bow), foam (modern bow) or other material to cushion the archer's hand.

- Nock indicator: place on a bowstring where the archer nocks the arrow for consistent, accurate shooting.
- String serving: thread that is wound tight around the middle of the bowstring to prevent wear to the main bowstring fiber from the arrow and the archer's fingers.

### Accessories for Bowhunting

Except for the quiver, each of the following accessories is optional equipment.

- Arm guard: a strap or sheath to protect a bowhunter's forearm, also known as a bracer.



Arm Guard

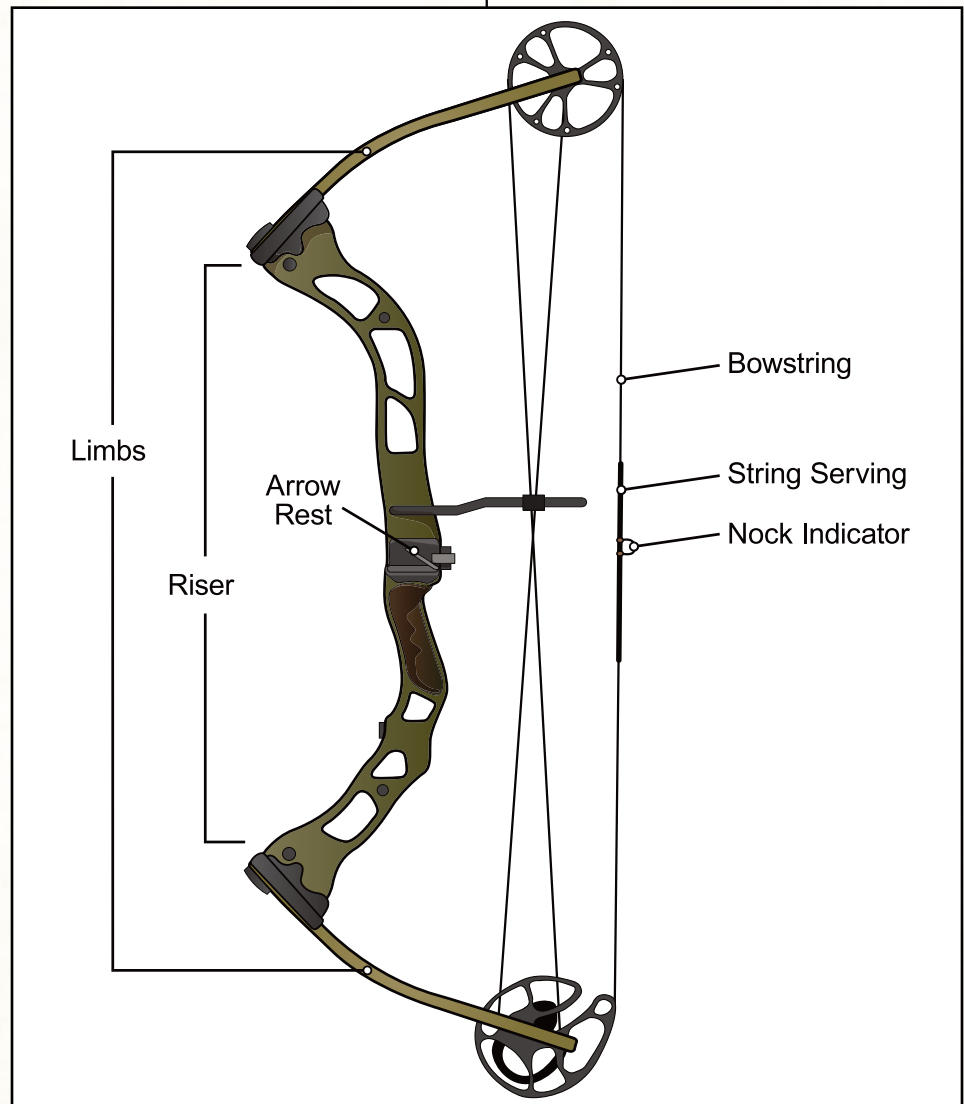
- Finger tab: small leather patch to protect the bowhunter's fingers, also known as a tab, used for shooting the longbow and recurve bow.
- Quiver: a container or pouch attached to the bow or worn by the bowhunter that holds the bowhunter's arrows.



Finger Tab



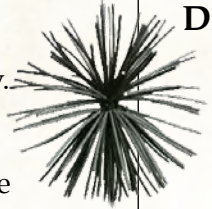
Quiver



- Shooting glove: specially designed glove that helps protect a bowhunter's fingers from injury when drawing and shooting a longbow or recurve bow.
- String silencer: a device attached to the bowstring to help reduce noise.



Shooting Glove



String Silencer

- Release: the act of shooting an arrow from a bow, also known as loose.

### Different Types of Bows

Today's bowhunters can choose from a wide variety of bows, including:

- compound bow
  - recurve bow
  - longbow
  - compound and recurve crossbows
- The recurve bow and longbow are called traditional bows—they are similar to the bows used by our early ancestors. The compound bow and compound crossbow are modern bows—they use various inventions developed in modern times that make it easier to use them.

The type of bow a hunter selects

depends mainly on how much or how little modern technology is desired. Traditional bowhunters prefer the longbow or recurve bow because these are simple, effective hunting tools. Modern bowhunters favor compound bows, compound crossbows and recurve crossbows, which give them the advantages of modern technology.

### Compound Bow

The compound bow was invented in 1969 in Missouri by Hollis Wilber Allen. Its development since then has been extraordinary. Today's compound bow consists of a lever system to draw back the limbs using the following specialized parts:

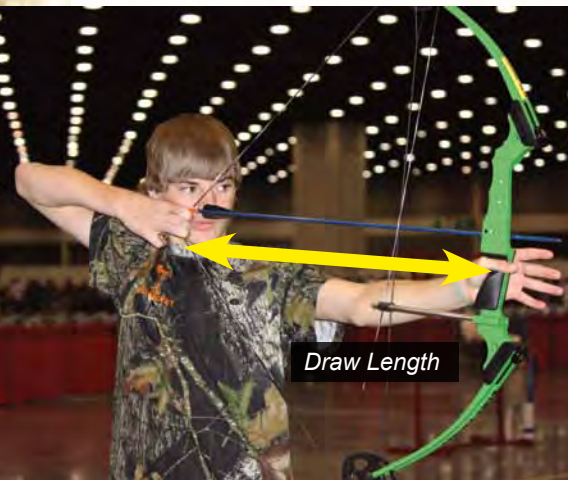
- Cables: strong synthetic string attached to the cams; when the

### How Does the Bow Work?

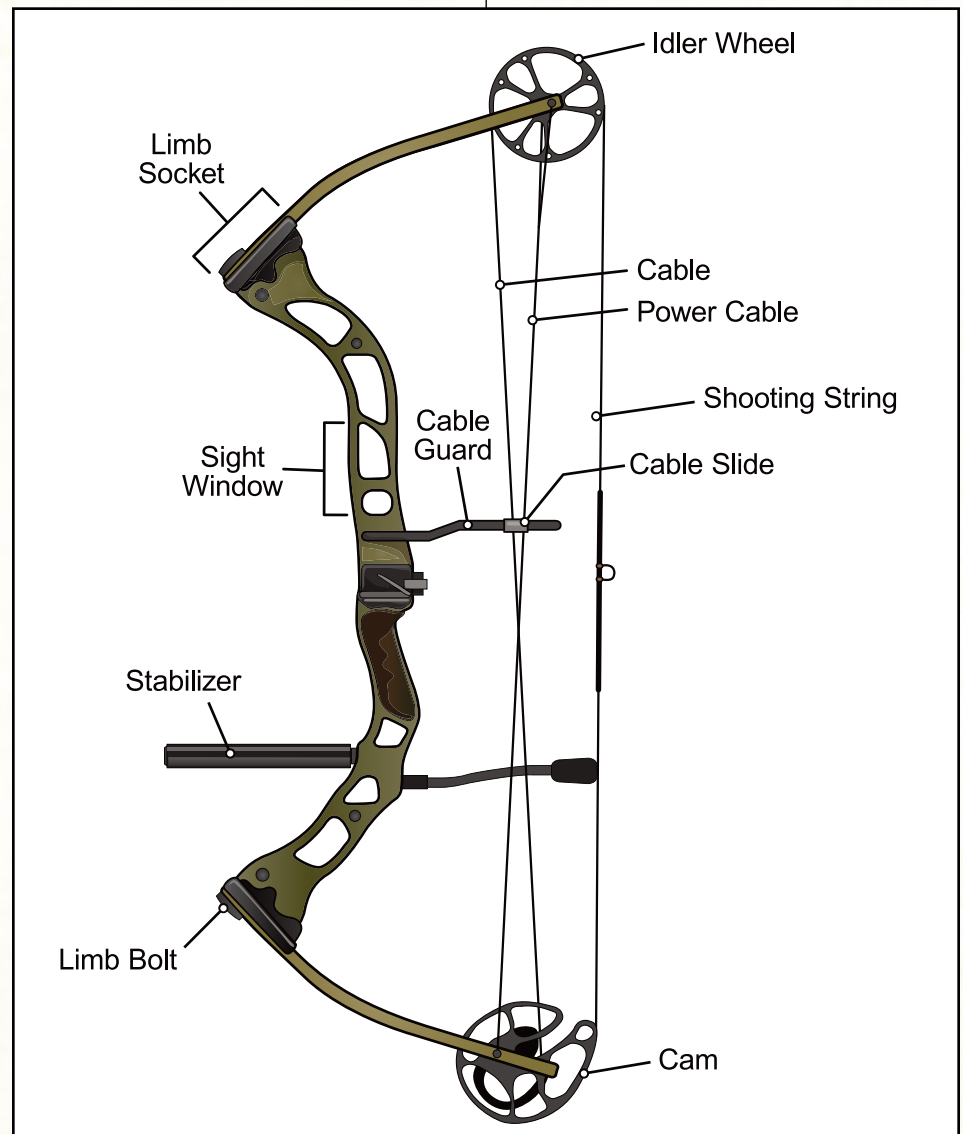
When a hunter pulls back on the string to draw the bow, energy is stored in the limbs. When a bowhunter releases the string with a nocked arrow, this energy transfers to the arrow, sending the arrow forward.

### Special Terms for Shooting a Bow

- Draw length: the length or distance that an arrow will be pulled at full draw, where the apex of the string is at the corner of the archer's mouth—the anchor point.



- Draw weight: the amount of force, measured in pounds, needed to bring a bow to full draw, also known as peak weight.
- Drawing: the act of pulling the bowstring to the anchor point with an arrow attached in preparation for shooting.





The lever system of the compound bow lets the bowhunter draw back on the string until peak weight is achieved, which could be 60 lbs. or more. At which point the bow “lets off” to a much lower

shorter and more easily handled than a longbow.

A recurve made from a single piece of wood is called a “self bow.” If it is made with natural wood laminates or includes animal parts such as horn, sinew and glue to strengthen the bow, it is called a composite recurve bow.

## Longbow

The traditional longbow also has been used by hunters for thousands of years. A longbow is typically as tall as the person who uses it. If it’s made from a single piece of wood, is called a self bow. Common hardwoods used to make a longbow are:

- Ash
- Bamboo
- Elm
- Hazel
- Hickory
- Lemonwood
- Maple
- Oak
- Yew



Long Bow

When animal horn, sinew and glue are used to construct a longbow it is called a “composite bow.”

Limbs of the longbow are narrow and straight when the string is not attached. When viewed in cross-section, a longbow has either a round or D-shape. Additional names for the longbow are: straight bow and stick bow.

## Recurves and Longbows

Recurves and longbows have a fixed draw weight, ranging from a low of 10 to 15 pounds for children to 60 pounds or more for adults. The draw weight of a traditional bow is determined by the bow’s design. As with all traditional bows, when pulling back on the string, the draw weight increases as the bow is drawn.

Typically, there is no sight on a traditional bow. Instead, bowhunters use

holding weight. The compound bow is relatively easy to hold at full draw because the “let off” weight may be only 15-20 lbs.

The compound bow has other distinctive features. It has limbs that are typically shorter and much stiffer than traditional bows, such as longbows and recurves. Because the parts of the compound bow are aluminum alloy, magnesium, carbon fiber or fiberglass, its durability and performance are affected very little by changes in temperature and humidity. There is no wood used in the main parts of a compound bow.

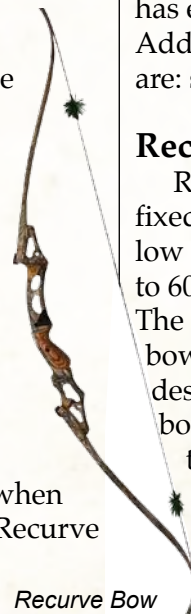
The compound bowhunter launches arrows with a mechanical release, similar to a trigger on a gun.

Also, bowhunters often use a sight system on a compound bow, which may include magnifying scopes, laser sights, or a peep sight in the bowstring and pins on the riser. The hunter should consult hunting regulations for the state or province where the hunt will occur to determine what equipment is legal for bowhunting.

## Traditional Bows

### Recurve Bow

Hunters have used traditional recurve bows for thousands of years. The recurve bow is easy to tell apart from other bows because its limb tips curve away from the bowhunter when the bowstring is unstrung. Recurve bows may be preferred for hunting because they are



Recurve Bow

- bowhunter draws the bowstring the pulleys turn, which causes the limbs to bend and store energy.
- Cable guard: a rod attached to the riser that holds the cables to one side to prevent arrow fletching from touching the cables during a shot.
  - Cable guard slide: device on the cable guard that helps keep the bow quiet by preventing “cable slap” during a shot.
  - Cam: located at the end of each limb on a compound bow, also called bow eccentrics; its shape may vary across different bow designs.
  - Idler wheel: A perfectly round wheel that works in association with the eccentric cam wheel to facilitate taking the bowstring to full draw.
  - Limb bolt: an adjustment bolt on the bow enabling the user to increase or decrease the draw weight.
  - Limb socket: a socket at each end of the riser for attaching upper and lower limbs to the riser.
  - Power cable: a heavy duty fibrous harness that attaches to the cam that pulls the limb tips toward each other when the shooting string is drawn.
  - Shooting string: bowstring that the arrow is nocked to, as different from the power cable.
  - Sight window: an area on modern bows that is a cutout of the riser, allowing the archer to see through the sight.
  - Stabilizer: a rod or set of rods attached to the bow to help reduce vibrations caused by the shot.

three fingers on the shooting hand to draw the bowstring and use the gap between the arrow point and the target to aim. This aiming technique requires practice, but can result in quick and quiet shots. Bowhunters who use a traditional bow usually launch arrows with bare fingers or with a tab or finger glove.

Modern recurve bows and longbows may be made with various laminated natural woods or may use a combination of different materials including wood and fiberglass. Bows made of wood and natural composite materials must be kept dry to prevent damage to the limbs and string.

Traditional bowhunters may make their own recurve and longbows following the designs used by people who lived in ancient times.

The recurve bow and longbow are simple but effective hunting tools. The recurve bow is capable of storing more energy in its limbs than the longbow. At full draw it is slightly easier to hold and aim than the longbow.



Many traditional bowhunters enjoy making their own bows.

## Compound and Recurve Crossbows

The modern compound crossbow is a compound bow mounted on a rifle stock. The stock, also called a tiller, uses a locking mechanism with a trigger to shoot the arrow, also called a "bolt" when used in a crossbow.



Compound Crossbow

Many of the parts included on a compound bow also are used on the compound crossbow, including sight systems such as the telescopic scope and laser.

The recurve crossbow is essentially a short recurve bow mounted on a rifle stock. Compared to a compound crossbow, the recurve crossbow is quiet when fired because it does not have additional mechanical devices.

Because of its design, the compound crossbow enables a bowhunter to use a draw weight that is greater than any other type of bow. Also, once the crossbow string is drawn and the firing mechanism cocked with an arrow in place, it can remain in that condition for a whole day of hunting. This fact, in addition to the use of a stock, trigger and sight system, provides support for more accurate shooting, especially during cold weather.

The draw length for a compound crossbow is much shorter than for a traditional



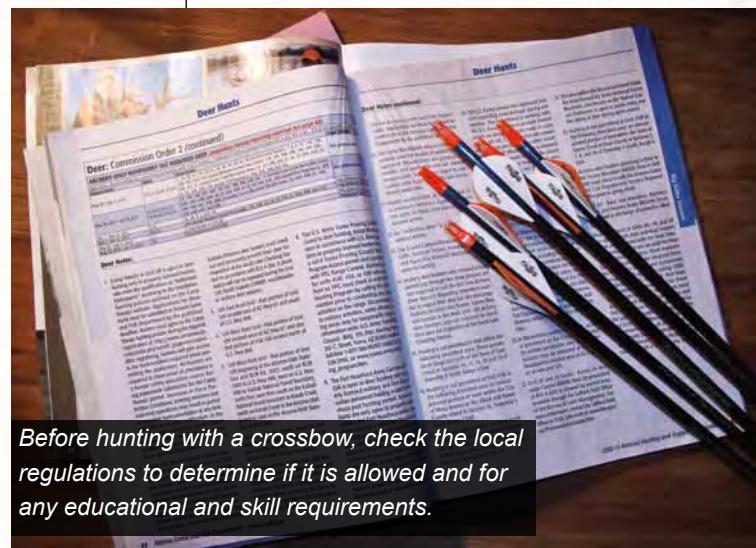
Recurve Crossbow

bow, which means the crossbow must have a much higher draw weight to transfer the same amount of energy to an arrow. For this reason, crossbows may be equipped with

specially designed cranks to pull the string to full draw and in the cocked position.

The disadvantages of the compound crossbow are it is generally heavier, more clumsy to handle and slower to fire, especially in comparison with the recurve bow and longbow.

Many states and provinces



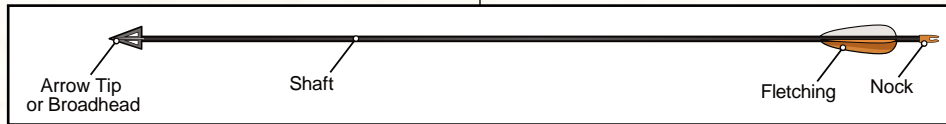
Before hunting with a crossbow, check the local regulations to determine if it is allowed and for any educational and skill requirements.

are adopting regulations to allow hunting with a crossbow. It is becoming more popular with hunters who have physical disabilities as well as older hunters, women and young people. The crossbow can be shot accurately with one hand while mounted on a rest.

## Lesson 3: Arrows

In this lesson you will:

- Identify the parts of arrows.
- Describe how a broadhead works



Bows shoot arrows. The four parts of the arrow are:

- Shaft
- Arrow tip or arrowhead
- Nock
- Fletching

Bowhunters want an arrow that flies accurately. The quality of the arrow's flight to the target and the arrow's impact on the target depend on the best combination of these four parts.

### Shaft

The arrow shaft is a long slender stick that may be made of cedar (for traditional bows only). It also may be a tube made of aluminum, carbon fiber, or composite (for example, aluminum and carbon fiber), or fiberglass for bowfishing. The other three parts of the arrow are attached to the arrow shaft. The arrow shaft must be straight for accurate flight to a target.

### Arrow tip or arrowhead

The front end of the arrow that strikes the target when the arrow is launched from a bow is the arrow tip or arrowhead. Arrow shafts may be equipped with one of four different kinds of tips, each of which serves a different purpose. Important aspects of the arrow tip are its design and weight. The four types of arrow tips are: field points, blunts, judo heads and broadheads.



## Field Points

Arrow tips that archers use mainly for target practice are called field points. Typically, they are made

of metal and have a rounded point. Field points are the most accurate style of arrow tip. Weights for field points vary from 100 to 180 grains.

### Blunts



Blunts are the flat-tipped arrowheads bowhunters use for target practice at tree stumps and for small-game hunting. Blunts may be made of rubber or steel. Blunts made of rubber are especially good for small-game hunting because they stun the animal without passing through its body. Steel blunts are preferred for stump shooting because they are more accurate than rubber blunts and are easier to pull from rotting stumps and downed trees.



### Judo Heads

Judo heads are steel arrow tips that have a small, dull point with four stiff, spring-loaded wires. Judo points are designed for hunting small game and birds, such as grouse and pheasants. The blunt point stuns the game animal. In flight, judo points will catch on leaves and



twigs, which helps bowhunters retrieve an arrow that missed the target. For that reason, judo points are effective for stump shooting.

### Broadheads



Traditional broadheads for wooden arrow shafts are made of obsidian, flint or bronze. Modern broadheads are made of steel. Bowhunters typically use broadheads for hunting big game, such as deer and elk. The broadhead must have a sharp, cutting edge that is wide enough to shoot well and kill the game animal quickly.

The most humane place to shoot a deer is in the area just above the heart, where the broadhead cuts into both lungs and major blood vessels, causing a quick, clean kill.

A broadhead is designed to kill animals through loss of blood. As the animal loses blood, it becomes unconscious and dies. The faster blood is lost, the faster this process occurs. A quick, clean kill is more humane for the animal. It is also better for the bowhunter because a good shot can result in spending less time tracking the animal.

Broadheads may have two, three or four edges that are razor-sharp. Blood vessels are very tough and rubbery so it is important that broadheads be extremely sharp. Some broadheads have replaceable blades to make sure the edges are always razor sharp. All

blades should be sharpened or replaced often.

Broadheads come in a wide variety of styles for big game hunting, including fixed and mechanically released blades. Also, there are broadheads specially designed for turkey hunting.

## Nock

At the back end of the arrow is the nock. On traditional wooden arrows, this is a notch cut into the wood and reinforced with sinew wrapped around the shaft to prevent splitting. On modern arrow shafts, the nock is made of plastic inserted into the shaft. The nock must be fitted to the arrow at the right place in reference to the fletching. It must also be straight and fit the bowstring. The nock connects the bowstring to the arrow. Its purpose is to hold the arrow on the bowstring until the arrow is launched.



Also at the back end of the arrow is a set of three or four matched fins or vanes. These vanes are two to five inches long and attached at equal spaces. Traditional arrows use feather fletching (for example, turkey wing primary feathers). Modern arrows use plastic fletching. The purpose of fletching is to quietly guide the arrow straight to the target.



## Lesson 4: Safety Rules for Bowhunting

In this lesson you will:

- Describe how to match bowhunting equipment.
- Explain the safety rules for bowhunting.

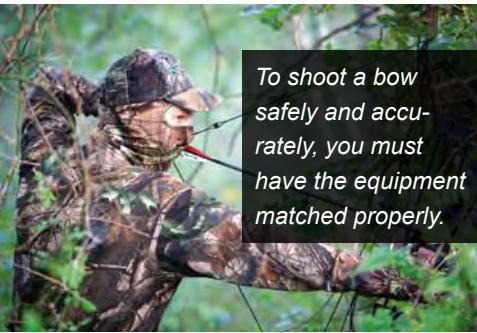
### Proper Matching of Bowhunting Equipment

To shoot a bow safely and accurately, you must have the equipment matched properly.

- Bow to hunter
- Arrows to bow and shooter
- Arrows to each other

### Match the Bow to the Hunter

The bow must fit the bowhunter's size (draw length), strength (how much draw weight can be pulled and held), and shooting style (traditional or modern equipment).



### Match the Arrows to the Bow and Shooter

The bow has a maximum draw length. At full draw, energy stored in the limbs will be transferred to the arrow when the bowstring is released. For safe and accurate shooting, the arrow must be of the correct length for the bow and the shaft must have the correct spine or stiffness. When the bowhunter releases the string, the transfer of energy causes the arrow to bend as it takes on this energy. Arrow shafts are designed to take up the energy without collapsing. How accurately they fly depends on arrow length and weight, type of arrowhead, and type of release—mechanical or fingers.



### Match the Arrows to Each Other



Arrows are designed for specific shooting purposes. Always match arrows to the purpose for shooting. Always use identical arrows.

Also, match all bowhunting equipment to the type of game hunted. For example, to hunt larger game, select a more powerful bow and arrows tipped with heavier broadheads that penetrate the animal's body, hit vital organs and blood vessels, and cause a rapid bleed out.

### Safety Principles for Archery Equipment

Following are some general safety principles that all bowhunters must learn and follow:

1. Wear finger protection when shooting—bare fingers quickly get sore, and if the shooting stance is not correct when releasing the bowstring, it can leave a nasty bruise on the forearm that holds the bow. Bowhunters also may use an armguard to pull loose fitting clothes up tight against the arm.

2. Keep broadheads in a quiver and covered at all times when not in use—they are designed to cut effortlessly through skin and tissue, and they will cut yours just as well as they will cut an animal's. Always use a broadhead wrench when changing arrowheads.
3. Inspect the bow limbs, riser, bowstring and cables (if so equipped) before every use—if there are cracks or splits in the limb or riser or if a string or cable should break, the bow limbs may actually shatter, sending bits of wood or fiberglass flying.
4. Never “dry-fire” a bow (drawing and releasing the bow without an arrow). Doing so may shatter the bow limbs causing injury to you or another person nearby.

Shooting a bow is best learned from an expert. In addition, special kinds of practice are needed to prepare for hunting in the field.

### Practice, Practice, Practice

A broadhead can't work if it never reaches its target. Experts at archery clubs and archery shops can help you choose the right bow for your size and strength, the correct arrows, and broadheads of the right size and weight to match your arrows. To fly straight, broadheads must be mounted on the shaft perfectly straight, but even that may not make them fly the same way as your practice arrows.

### Tips for Archery Practice

When practicing, follow these



Use practice arrows with field points to develop your skill as an archer.

tips to develop accurate archery skills for bowhunting.

Wear hunting clothes when practicing. If the hunt will occur during cold weather, practice shooting while wearing those thicker, bulkier clothes.

Start out by shooting at spot targets, to develop accuracy. After becoming good at hitting the spots, change to targets without aiming spots (such as 3-D animals) to simulate aiming at game.

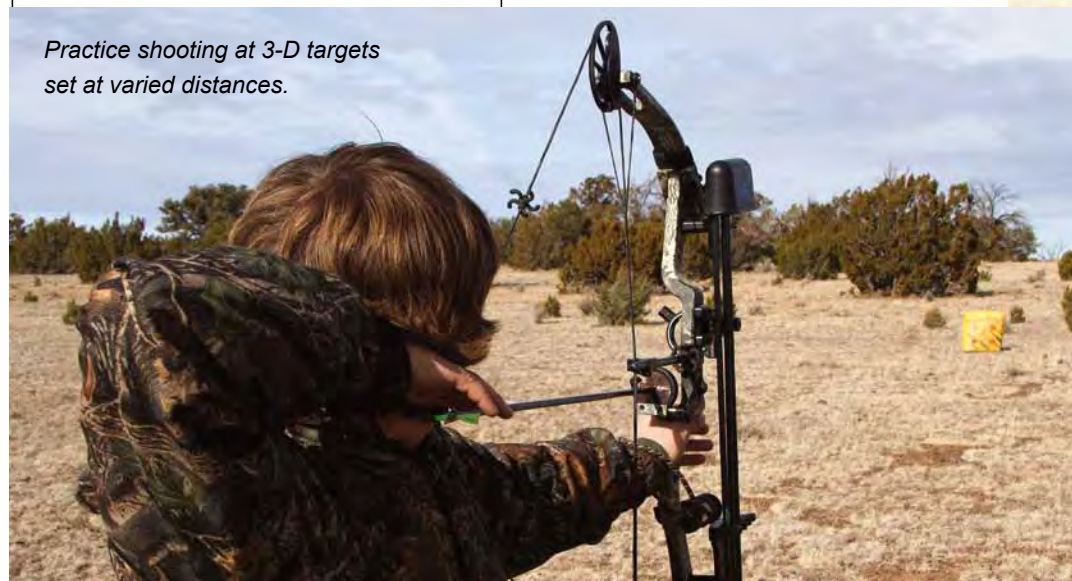
Practice shooting at 3-D targets set at varied distances out to the maximum range for accurate kill shots.

Practice shooting in real



Learning to judge distance takes practice.

to the ground as soon as they are shot. After about 20 yards or so, arrows drop quickly and will



Practice shooting at 3-D targets set at varied distances.

hunting conditions. If possible, shoot at a portable target from the actual blind or treestand, to duplicate terrain, weather, lighting conditions, times of the day, body positions, etc.

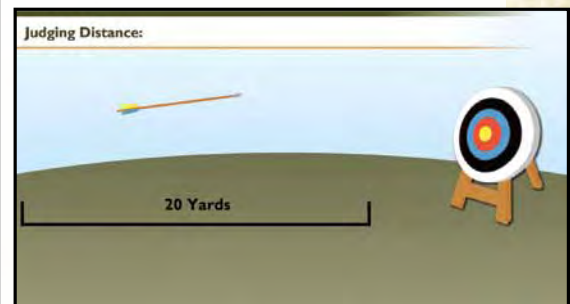
Practice with broadheads before the hunting season. Broadheads often fly differently than field points. Use foam targets designed to stop broadheads. Then re-sharpen or replace these used blades before hunting.

### Judging Distance

It is important that bowhunters know how far away the target is. Arrows, like bullets, start falling

miss the target unless the archer aims high. Archers need to know exactly how far away the target is to hit it.

The farther away the target is, the more accurately the shooter



Shoot only out to 40 yards, taking into account your personal limitations.



must judge the range. At longer distances, even a small error in judging the range will cause a mere wound or a complete miss. For this reason, most bowhunters will not shoot more than 20 or 30 yards, depending on their shooting ability.

Also, when practicing or bowhunting in a wooded area, on the ground or from a treestand, take into account the arrow will fly up in an arc to the target when the string is released. If there are leaves, twigs or tree limbs in its path, the arrow will likely ricochet and miss the target. If the arrow hits a limb, it could break up, making a sound like a rifle shot.

### Shot Placement for Bowhunting

When hunting with a firearm, the animal may be hit a little

When bowhunting, the only place to shoot an animal is in the center of the chest. The heart, lungs, liver and many major blood vessels are located here. A solid hit in the chest area will almost always result in a quick, humane kill and a good blood trail to follow. Also, the chest is larger than any other part of the body in most animals, so you have a bigger target to aim at and a larger margin for error.

Because shot placement is so



outside of the vital zone and die quickly. This is because bullets work differently than broadheads. When a bullet hits a target, it has so much energy that the shock of the impact can be enough to kill the animal. **THIS IS NOT TRUE FOR BOWHUNTING.**

When hunting with a bow and arrow, it is important to pick out the animal's vital zone and hit it. There is a small margin for error.

critical, bowhunters need to understand where the vital zone is located when a game animal is facing different directions.

Remember, the actual target to hit is inside the animal, and animals are continually moving and shifting position. Also, many bowhunters hunt from treestands or other elevated positions, which also changes where the arrow must enter the body to hit the target.

#### Shot Placement for Bowhunting:

The best opportunity for a **quick, clean kill...**

**BROADSIDE/QUARTERING AWAY**



#### Shot Placement for Bowhunting:

The bowhunter should **NOT** take shots when

**Facing TOWARD**



**Directly AWAY**



The best opportunity for a quick, clean kill is when the animal is broadside or quartering away slightly. The bowhunter should not take shots when the animal is facing directly toward or directly away. At these angles, the vital area is guarded by large bones (shoulder blade and leg bones in the front, and hip and leg bones in the back).

When hunting from a treestand, don't put the stand too high above the place where the animal will most likely approach. The bodies of most game animals (such as deer) appear very narrow from above, which means the higher up in a tree, the smaller the target area is. Shooting straight down on an animal also is not a good idea. The large back bone that protects the spine covers a big portion of the vital area and may stop or deflect the arrow.