



Orange County 4-H

Novice Archery Project Book

Instructions

- Complete sections of your Novice Archery Project Book throughout the year.
- It is required to complete either a Junior, Intermediate, or Senior Project Report to turn in with this Project Book for proper judging.
- Fillable Project Reports can be found at <http://sfyl.ifas.ufl.edu/orange/4-h-youth-development/4-h-youth-membership-and-project-areas/#Proj%20Books>

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Welcome to the Sport of Archery

As an introduction, I welcome you to the sport of Archery. It has been my sport for over 65 years. Millions of people shoot archery for many reasons. Some people need to hunt to put food on their table. Some, like us, just like to hit a target.

Let's think how it all started. Man had to feed his family and tribe. He could have started with a club to hit the animal. I think that would make the animal torqued off, so what could he do? He took a long pole and sharpens one end. Then he would run up and jab the animal with it. This also upset the animal, more than likely the animal would turn on the man and have him for lunch. He then found out he could throw the stick and run away to a place where he could wait for the animal to bleed to death. This worked O.K., unless he was a slow runner. What could he do? He tried making a sling out of leather; he could then place the stick in the sling and throw it a lot further than he could by just with his hand and arm. This worked for many years, but still some times the animal still had him for lunch. One day he was messing around and he tied a piece of leather to both ends of a long stick and he made himself a bow. He could now be at a safe distance when he shot the animal and he then could have the animal for his lunch. When did this all happen? There are cave drawings that have been dated as far back as 50,000+ BC.

The pages of history are filled with images of men and women, from ancient Egyptians to Pygmy bushmen, armed with their bows and arrows. They hunted for food, protected their families, and fought in history's most significant battles. As early as the 14th century the English were required to carry and practice with the long bow. On market day, boys and men from 16 to 65 would have archery contests, to win a gold coin. Henry VIII let his subjects know they must be proficient at 220 yards. A good archer could place 12 arrows per minute into a man size target. A man with a crossbow would be lucky to launch two bolts (arrows) in one minute. The Native Americans did not have the good wood like the Yew tree that the English had. So as archers they were not as good but as stalkers they were one of the best. They could sneak up on an animal and shoot it from a short distance.

Archery really started in this country right after the Civil War. The Union banned former Confederate soldiers from using firearms, so they turned to the bow for hunting and recreation. This led to the creation of the National Archery Association of the United States in 1879 and then the National Field Archery Association soon after.

Archery made its debut as an Olympic sport at the Paris Olympics of 1900 and appeared again in 1904, 1908, and 1920 games. It did not appear in the Olympics again for fifty-two years. The Federation Internationale de Tir al' Arc (FITA), founded in the 1930s, played a significant role in the reintroduction of competitive archery to the world. Archery returned as an Olympic sport in 1972. And as they say the rest is history.

Again welcome to our club so let's get shooting!

Larry Middour, 4-H Instructor



Novice Pre-Test

Experience

1. What is the 4-H Pledge?

2. What does it mean when you hear 2 whistles on the range?
 - a. Line up to the shooting line
 - b. Nock your arrow
 - c. Retrieve your arrows

3. What is Mr. Larry's #4 through #7 rule?
 - a. Run
 - b. Don't Run
 - c. Don't shoot the instructor

4. Where is an arrow supposed to point always?
 - a. Up
 - b. Down
 - c. At the target

5. What does nocking your arrow mean?



Novice Pre-Test

Experience

6. I will never shoot an arrow straight up.

Cj gemyour answer:

True

False

7. What is a quiver?

8. What is 3D Shooting?

9. Which is a compound bow?



10. What is draw weight?

- a. At full draw, the distance from the knocking point to the side of the farthest from the archer
- b. The weight measured in pounds, used to bring the bow to full draw.
- c. The positions of the archer when the bowstring has been drawn to the archer point.



4-H & Life Skills

What is 4-H?

At 4-H we pride ourselves in developing youth in our community. As part of this program we like to include Life Skills with everything that we do. Life Skills are essential in preparing you in your transition to adulthood. The UF/IFAS Extension 4-H Youth Development Program uses a learn-by-doing approach to help youth gain the knowledge and skills they need to be responsible, productive citizens. This mission is accomplished by creating safe and inclusive learning environments, involving caring adults, and utilizing the expertise and resources of the University of Florida and the nationwide land grant university system.

The 4-H's: Head, Heart, Hands and Health

4-H Motto: To Make the Best Better

4-H Slogan: Learn by Doing

Targeting Life Skills:

Head: Knowledge, Reasoning & Creativity
Using one's mind to form ideas, make decisions, imagine, consider and examine

Heart: Personal & Social
Establishing connections with people that are wholesome, caring, understanding and kind.

Hand: Vocational & Citizenship
Providing, supplying, working to accomplish something or earning to support oneself through physical or mental effort.

Health: Health & Physical
Living one's life, pursuing one's basic nature and involved in personal development.



4-H Members Pledge:

**I pledge my HEAD to clearer thinking,
my HEART to greater loyalty,
my HANDS to larger service,
and my HEALTH to better living.
For my club,
my community,
my country and my world.**



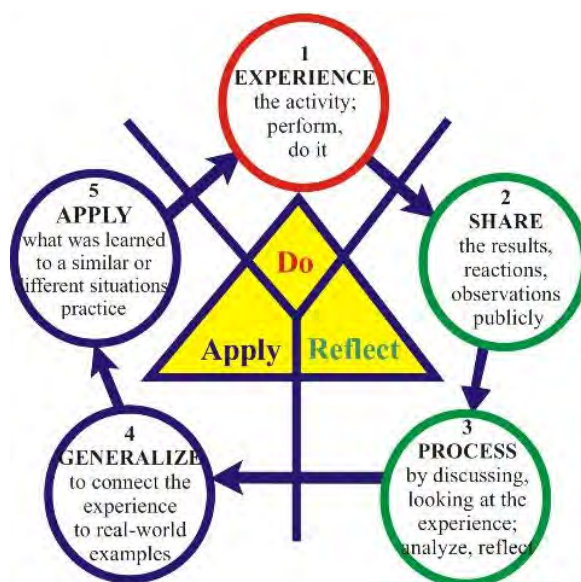
Life Skills		Completed?	Short Term Goals, Project Accomplishments
Health	Being		Memorized the 4-H Member Pledge

Date Experienced _____

Approved by _____



Experiential Model in 4-H



Throughout this project book you will see where we try to incorporate the Experiential Model alongside the Life Skills that will be inadvertently learned through dialog and experience. When this model is used, you will both experience and process the activity. You learn from thoughts and ideas about the experience. Each step contributes to your learning.

Providing an experience alone does not create experiential learning. Experiences lead to learning if you understand what happened, see patterns of observations, generalize from those observations and understand how to use the generalization again in a new situation, then we will have done our job.

1. **Experience**: You do before being told or shown how.
2. **Share**: You describe the experience and their reaction.
3. **Process**: You discuss what was most important about what you did.
4. **Generalize**: You relate the project and life skill practiced to your own everyday experiences.

Apply: You share how you will use the project and life skill practiced in other parts of your life.



4-H Expectations

(Adapted/modified from the University of Washington 4-H Archery project)

What Can You Learn Through This Project Book?

1. Become familiar with the history of archery
2. Learn Life Skills
3. Setting attainable goals
4. About shooting regulations.
5. Archery basics to advance techniques.
6. To select and care for a suitable bow and arrows.
7. To shoot a bow and arrow accurately and safely.
8. Community service and collaboration
9. To have FUN and enjoy archery as a sport.

Your instructors vow to walk you through the following attainable goals for this year.

Instructor's Signature _____

What is expected of 4-H Members in this Project?

1. Be a member of the club.
2. Help with the yearly club program which includes individual goals.
3. Be active, cooperative and attend club meetings regularly.
4. Learn and practice archery safety.
5. Participate in some field trips and/or archery matches.
6. Participate in community service projects set by the club.
7. Complete a yearly project record and keep permanent record up to date.
8. Participate in the Archery Advancement Program
9. Listen to the Range Master.
10. Help the new archery shooters and tell them about the club.

Your parents' pledge to assist you in attaining these goals for this year.

Parent's Signature _____



4-H Expectations

4-H Archery Advancement Program

Age Requirements – Participants will abide by the state 4-H age requirements. Juniors ages 8-10, Intermediates ages 11–13 and seniors ages 14–18. All ages are based on the age of the participant as of September 1 of the current 4-H year. These age ranges will be used to determine archer's divisions.

This program is designed to:

1. Help you learn more about archery.
2. Help you improve your shooting skills and score.
3. Give you credit for extra work done.
4. Allow you to advance at your own pace.

Your progress in the Advancement Program will become a part of your 4-H record. As you complete each requirement, fill in the date and have an instructor initial it. There are four levels of advancement:

1. **Novice:** This level encompasses the first year in the program.
2. **Intermediate:** 2nd years+
3. **Advanced:** 3rd year+
4. **Junior Instructor:** 14-18 years old

When you have completed the required job for each step, you will receive a 4-H Archery Advancement certificate. Study each requirement carefully and do your work well. Good luck!

Circle the # indicates this year's Advancement Program Year for you:

1 2 3 4 5 6 7 8 9 10

4-H Exhibits and Displays

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

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

1. Why the weight and the spine of an arrow must be matched to the weight and cast of the bow.
2. The use of aiming points in relation to trajectory.
3. The history of archery and its importance to development of civilization.
4. How to fletch an arrow.
5. How to determine the length of arrows needed by an archer.
6. How to select a bow.
7. Archery games.



Archery Range Rules & Procedures

(Adapted from Kenosha County 4-H Archery Handbook)

Archery Range Rules

1. Know and obey all range commands.
2. Keep your arrows in your quiver until you are told to shoot.
3. Always wear your arm guard and finger tab.
4. Only use the arrows the instructor gave you. Remember what they look like.
5. Always keep your arrows pointed down or towards the target. Shoot only at the target.
6. If you drop an arrow, leave it on the ground until you are told to get your arrows.
7. **Always walk** at the archery range.

Archery Range Whistle Commands

- ✿ (2) Two Blasts -- "Archers to the shooting line."
- ✿ (1) One Blast -- "Begin shooting."
- ✿ (3) Three Blasts -- "Walk forward and get your arrows."
- ✿ (4+) Four or More Blasts (series of blasts) -- "STOP SHOOTING immediately, put arrows in quiver."

Archery Range Procedures

- ✿ Stand behind the waiting line until you hear 2 whistles or "Archers to the shooting line." Pick up your bow and straddle the shooting line.
- ✿ Keep your arrows in your quiver until you hear 1 whistle or "Begin shooting."
- ✿ After you have shot all of your arrows, step back from the shooting line, set your bow on the rack, and wait behind the waiting line.
- ✿ After everyone is done shooting and behind the waiting line, the instructor will blow the whistle 3 times. "Walk forward to get your arrows ...Stop at the target line."

Pulling Your Arrows

- ✿ Two archers at a time, from each target, may go forward from the target line to pull their arrows.
- ✿ Stand to the side of the target and make sure that no one is standing behind your arrows.
- ✿ Pull your arrows out one at a time, and put them in your quiver.
- ✿ After you have pulled all of your arrows, return to the waiting line.

Mr. Middour's Range Rules

1. Don't shoot the Range Master!
2. Don't shoot the Range Master's Assistants.
3. Don't shoot anyone else!
4. Don't Run!
5. Don't Run.
6. Don't Run.
7. Don't Run. (Do I think this is important? You bet I do!)
8. All pointed objects are pointed at the target.
9. Do we ever shoot an arrow straight up into the air? **(NO)**
10. Let's have **FUN**.



The Ten Commandments of Archery

Plus + Five

1. I will always remember that my bow can be deadly and I will do nothing that might endanger others.
2. I will not nock my arrow (put an arrow on the string of the bow) or draw a bow when a person is in front of me, and I will always shoot towards a target.
3. I will not try to shoot anything that a person is holding.
4. I will never “*dry*” *fire* a bow (pull back on a bow string with no arrow in place).
5. I will **never** shoot an arrow straight up.
6. I will never release an arrow where I cannot see the entire flight of the arrow.
7. I will not use damaged equipment.
8. I will check arrows, before shooting, for loose feathers, points and nocks, and repair before using. I will check for frayed strings and inspect arrows and bows for cracks, and will destroy them if damaged.
9. I will never shoot an arrow that is too short for my draw.
10. I will not shoot at a target that is too thin to stop my arrow.
11. When shooting with another person, I will not go forward to retrieve my arrows until an “all clear” sign has been given.
12. When looking for arrows beyond the target, I will either set my bow in front of the target or place an arrow on top of the target to warn others that I am behind the target.
13. I will always wear proper clothing and use proper hygiene for safe shooting and will always be courteous toward others.
14. I will strive toward conserving wildlife and preserving the beauty of my country.
15. I will always listen to the Range Master and follow his or her commands.



Read, Learn and practiced the “Ten Commandments Plus 5 of Archery Safety”

Date **Generalized** _____

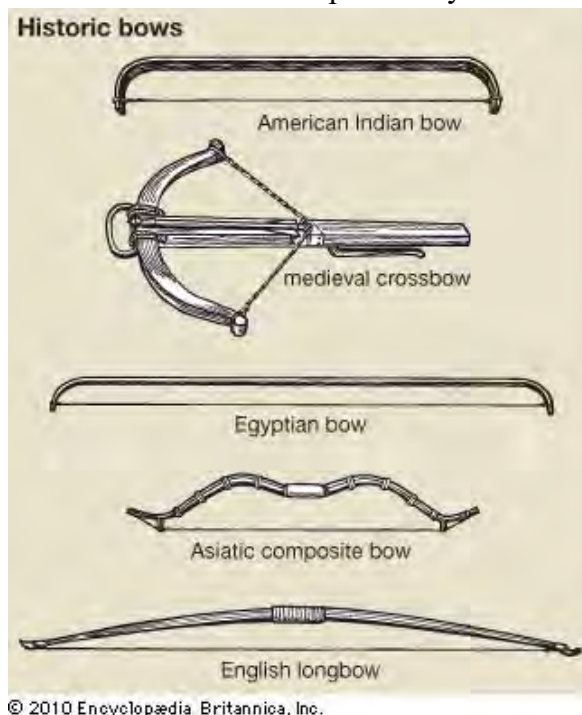
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Archery History

Here is a quick look at some of the history behind Archery. Archery is one of the oldest arts still practiced. Evidence of ancient archery has been found throughout the world.

For example, in China, archery dates all the way back to the Shang dynasty (1766-1027 BC). War chariots of that time carried three-man teams: driver, lancer and archer. During the Zhou (Chou) dynasty (1027-256 BC) nobles at court attended sport archery tournaments that were accompanied by music and sprinkled with elegant gestures.



Development in Asia

When the Chinese introduced archery to Japan in the sixth century, it had an overriding influence on later etiquette and techniques. One of Japan's martial arts was originally known as kyujutsu (the art of the bow), now known as kyudo (way of the bow).





Archery History

Modern Kyudo is practiced primarily as a method of physical, moral, and spiritual development. After certain ritual movements, the archer moves to the shooting line and shoots from a distance of 28 meters at a target 36 cm in diameter set in a bank of sand that is roofed over. The bow used is 2.21 meters long and made of laminated strips of bamboo and wood.

In the Greco-Roman period, the bow was more used for personal exploits or hunting, rather than warfare.

Archers are frequently seen on ancient pottery pieces. The Parthians were horsemen who developed the skill of swiveling around in the saddle and could shoot backwards at full gallop.

Middle Eastern superiority in archery equipment and technique continued for centuries. With bows like those of the Assyrians and Parthians, Attila the Hun and his Mongols conquered much of Europe and Asia, and Turkish archers threw back the Crusaders. The Asian and Turkish bows were highly efficient and the record shot with a composite Turkish flight bow was close to 900 yards, far beyond the capability of an English yew bow.

Mythology

The popularity of archery is reflected in the many ballads and folklore, such as for instance Robin Hood, to name the most famous one.



Image: Nottingham's official Robin Hood, Tim Pollard.

References to archery are also frequently made in Greek mythology, in which the story told of Odysseus in Book 21 of the *Odyssey* is a well-known example. Odysseus is mentioned as being eminently skilled in the art of archery. Penelope, thinking that her husband will never come back after 20 years of absence, forms a resolution to determine which of her suitors shall receive her hand by shooting with Odysseus' bow. Odysseus, back from the Trojan War and disguised as a shepherd, is the only one able to draw his own bow and shoot an arrow through twelve rings. This way he can prove to his wife who he is and defeat all of those who had taken advantage of his long absence.



Archery History

Adapted from: <https://worldarchery.org/news/93847/brief-history-archery> & <https://www.britannica.com/sports/archery>

English literature also honors the longbow for famous victories in the battles of Crecy, Agincourt and Poitiers.

The first known organized competition in archery was held at Finsbury, England in 1583 and included 3,000 participants!

By the time the Spanish Armada attempted to invade England in 1588, an English county troop levy consisted of one-third bowmen to two-thirds soldiers with guns. However, by the 30 Years War (1618-1648) it was clear that, due to the introduction of gunpowder, the bow as weapon belonged in the past.

Archery as a sport

Since then, archery has developed as a recreational and competitive sport.

The first American archery organization was the United Bowmen of Philadelphia, founded in 1828. In the early days the sport was, as in England, a popular upper and middle-class recreation. In the 1870s many archery clubs sprang up, and in 1879 eight of them formed the National Archery Association of the United States. In 1939 the National Field Archery Association of the United States was established to promote hunting, roving, and field archery. The number of archers around the world increased phenomenally after 1930, led by remarkable growth in the United States. By the late 20th century there were probably more than 10 million American participants in all forms of the sport. Their ranks included those who use the bow to hunt game; those who engage in shooting at targets of several kinds at various distances for accuracy; and those who strive for ever-greater distances in “flight” shooting.

Up to about 1930 the history of Western archery as a sport was the history of the longbow. This bow had disadvantages, however. It was subject to differing conditions of temperature and humidity, it needed to be left unstrung when not in use, and using it was an art. The bow that replaced it in the mid-20th century was a composite design made of laminated wood, plastic, and fiberglass that was less affected by changes of temperature and humidity. The limbs of the composite bow are laminated, with a thin strip of wood serving as a core for facing and backing strips of fiberglass that are secured to it with epoxy glue. The bow's rigid middle section gives the archer a good grip, and its thin, wide, fiberglass limbs are exceedingly strong. The composite bow gives superior accuracy, velocity, and distance in comparison to the longbow. Using a modern bow, target archers of equal skill can score an average 30 to 40 percent higher than they can with the longbow. The modern composite bow shoots farther than the longbow: a maximum distance of more than 775 meters (850 yards) has been obtained with it, compared to about 275 meters (300 yards) for the longbow. The efficiency (the percentage of energy in a fully drawn bow that is transferred to the arrow at the moment of loose) of the modern bow doubles that of the longbow, the velocity of the arrow with the new bow reaching 65 meters (213 feet) per second as opposed to 45 meters (150 feet) per second. The wooden arrows used by archers for millennia have been replaced by ones made from aluminum-alloy or fiberglass tubing, and plastic fins/fletchings have replaced feathers. The arrows' points are made of steel, and nylon is used for the bowstring.

A more recent innovation is the compound bow, which uses a system of cables and pulleys to make the bow easier to draw. Compound bows have achieved increasing popularity since a two-pulley design was introduced in the 1960s. They are used in field archery, in hunting, and in international target archery competition.



Goals of Archery

Both recreational archers and competitive archers simply want to shoot their best game or highest score.

Archery is not merely slinging arrows down range with no particular thought to where the arrow comes to rest. It is a shooting sport that helps you become accomplished and mentally focused.

Archery is like most other sports - learning is progressive.

1. There is a systematic approach to developing good form.
2. Good shooting form leads to precise shot execution
3. Precise shot execution leads to tighter arrow groups.
4. Tighter arrow groups leads to higher scores.
5. If you are over bowed then your ability to learn proper shooting form or biomechanical alignment is drastically reduced.

Your goals in archery are influenced by the choices you make so here are some things to keep in mind not only when you begin but throughout your archery career:

Too much strain on undeveloped muscles and joints is painful

- ❖ A draw weight that is too heavy will prevent the archer from learning proper shooting form
- ❖ More repetitions at a low draw weight facilitates the learning process by developing motor skills
- ❖ More repetitions at lower draw weights helps build muscle memory making the shot cycle easier to perform
- ❖ Developing good muscle memory and perfecting your shot cycle and execution lead toward tighter arrow groups and greater precision
- ❖ Shooting a bow with a draw weight that is too heavy can lead to personal injury and puts everyone in reach of the arrow at risk

Setting your own goals

On page 20 of this project book we touch on the kind of shooting you would like to do....once you determine that goal write it below and we can move on from there. This will be your long term goal for this project book.



What kind of shooting do you want to try? (Long Term Goals)	Type of Archery

Along the way, together we will also accomplish some of the short term goals identified on pages 61-64 (Improvement of Skills).



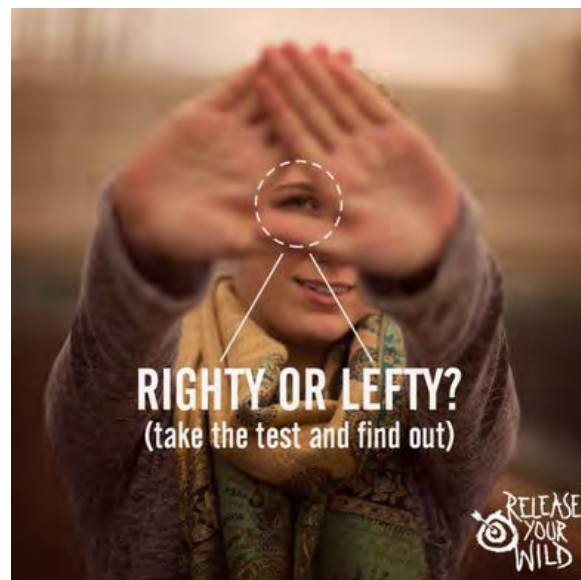
Determine Eye Dominance

On this page we will demonstrate how to test yourself and determine what eye is your dominant eye.

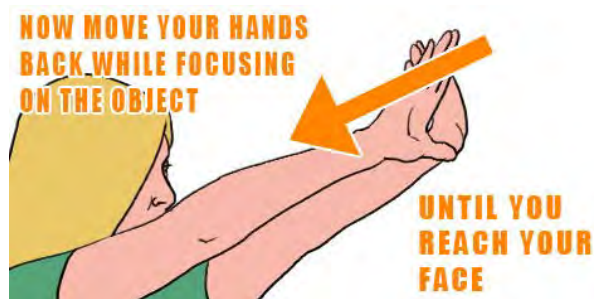
There are simple methods to test an archer's eye dominance, the results will be the same. If there is any uncertainty about the results then do all of the self-testing methods mentioned below.

Distant Object Method

1. Extend your arms out in front of you at eye level with your palms facing away.
2. Bring your hands together forming a small "V" shaped hole or view window by overlapping your thumbs and fingers.
3. Select a small object at least 10 feet in front of you and look at it with both eyes through the hole in your hands.
4. While remaining focused on the object close one eye and take note of what happens then open the eye.
5. Now close the opposite eye and take note of what happens to the object.



Coach-Pupil Method (Pair up with another member - one person stands in front of the other)



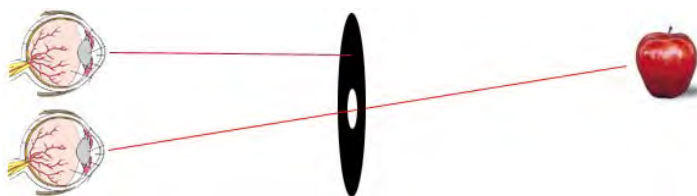
1. Extend your arms out in front of you at eye level with your palms facing away.
 2. Bring your hands together forming a small "V" shaped hole or view window by overlapping your thumbs & fingers.*
 3. Focus on your coach's nose approx. 10 feet in front of you & look at it with both eyes through the hole in your hands.
 4. While remaining focused on their nose, close one eye and take note of what happens then open the eye.
 5. Now slowly draw your hands closer to your face
- When you have drawn your hands back to your face the view window will be placed over one eye or the other. This is your dominant eye. Your coach standing in front of you will confirm their observations.
- * Note: instead of forming a small "V" you can also use Kaleidoscopes, toilet paper tubes and similar objects. When the person is unaware of being tested the tube will almost always be brought to the dominant eye.



Determine Eye Dominance

Finger-Point Method

1. Extend your arm out in front of you.
2. With both eyes open raise your thumb or align your index finger on a distant object.
3. Close the left eye and observe the location of the object.
4. Now open the left eye and close the right eye and observe the location of the object.



- It is likely that when you closed one eye or the other, the object disappeared or appeared to move to one side or the other.
- It is also likely that when you closed the opposite eye, the object remained stationary in the view window you created with your hands.
- The eye that kept the object stationary in the view window is your dominant eye.
- If you performed this simple test and the object did not appear to move when you closed one eye or the other then you are among the rare individuals who have central vision. If that is the case then you are likely to be a very effective archer regardless of which hand you shoot with.

Should I Shoot With Both Eyes Open?

Shooting with both eyes open will work for some archers but for others it is not the best idea. For those people that must, it is likely that they can effectively shoot with both eyes open.



Life Skills		What did I learn, Adult/Leader helped me with my project
Head	Managing	Which Method did you use to determine your eye dominance?
Head	Thinking	Which is your dominant eye?
Hands	Working	Who helped you determine your eye dominance?
Heart	Relating	Were you surprised? What was your original theory?

Date **Shared** _____

Approved by _____



Right or Left Hand Dominance

Should I shoot archery with my right or left hand?

The answer depends greatly on your preference and goals as an archer. Once you have determined your dominant eye, then you can determine if you want to be a cross dominant shooter or not. Archery relies on motor skills and muscle memory. If you are a novice, then it will be easier to train your muscles. There are challenges involved in retraining yourself to shoot with the opposite hand if you will be a cross dominant shooter, but we encourage you to shoot with your dominant eye for the best advantage.

Many people take for granted the role of eye dominance in their daily routine and the parallax effect is rarely a consideration...until you get involved in a shooting sport. Eye dominance is actually referred to as **ocular dominance**. **Ocular dominance** is tendency to receive visual input through either the left eye or through right eye. **Parallax** is an optical illusion it's the displacement of an object in relationship to its true location.

Parallax is something that you experience in your everyday life and you don't even realize it.

Here is an example:

1. Extend your arm out in front of you and point your index finger up.
2. Now stare at the index finger momentarily then close your left eye.
3. Now open the left eye and close the right eye.
 - If your finger appears to move horizontally as you switch eyes, you are experiencing the parallax effect.
 - If your finger does not appear to move from left to right then you may be part of a small population who do not have a preference as to whether your left eye or right eye receives information.

Either way...you are normal!

Why Is Parallax And Eye Dominance Important In Archery?

Eye dominance is important to the archer because one dominant eye works a little harder than the other. While we use both eyes to see, you will use your dominant eye to focus on an object or your point of aim. If you are lucky, your dominant eye will be on the same side as your dominant hand. Example: If you are left handed and your left eye is dominant.

What does all this parallax and ocular dominance stuff mean to me as an archer?

Archers who shoot a bow that matches the ocular dominance possess a competitive advantage. If you are left handed and your left eye happens to be your dominant eye then you will experience less of the parallax effect. However, if you are right handed and your left eye is your dominant eye, you will experience more of the parallax effect and it will be necessary to compensate a greater distance to offset for the perceived displacement.

Cross dominance means your dominant eye is on the opposite side of your dominant hand.

While there is no scientific evidence to support the claim, it is said that cross-dominance is a competitive advantage in sports such as baseball, golf and tennis. In archery, you want your dominant eye to be "in-line" or as close as possible to the bow string and arrow shaft. If your dominant eye is on the opposite side of the face as your dominant hand and you shoot with both eyes open you will have to adjust your horizontal point of aim to compensate for the **parallax effect**. In other words, you may have to aim to the right or to the left of the actual target. This is sometimes referred to as **windage**. In archery we use the term **windage** to identify how far we compensate for the parallax effect. **Windage** is actually defined as the influence of the wind in deflecting a missile or the amount of such deflection.



Right or Left Hand Dominance

Key to success for Cross Dominant Archers...

Young teens and youth archers who are cross dominant can quickly re-train themselves to shoot on the same side as their dominant eye. The exception is for those individuals that are somehow afflicted with motor skill disorders which make it difficult for the person to perform complex tasks.

There are many advantages to retraining motor skills particularly for anyone in shooting sports, but it does take a little time and determination.

Older teens usually take a little longer only because they are more settled on their dominant motor skill capabilities and they are more resistant to change.

For the most part, it takes a lot of time of daily training before finally settling into a point when you can begin fine tuning the shot sequence. You need daily training sessions, to get the motor skill and muscle memory developed. At around 1000 repetitions an archer begins to feel comfortable and more confident. Keep in mind that this is just a very rough guideline of what you can expect if you want to retrain your motor skill as it relates to your non-dominant hand. The key to success in the latter example is to continue to shoot with both eyes open but to "focus out" the opposite eye. Shooting with one eye closed is possible but the archer is less stable and less inclined to receiving peripheral input that helps maintain balance. You can train your formerly non-dominant eye to receive information and focus on your target IF you can train your other eye to remain open so it continues to receive light and peripheral input. A note of caution, excessive shooting can cause a serious injury so listen to your body's "tired" sensor.

So, the bottom line is this, if you are set in your ways and not willing to retrain your motor skills to correct for cross dominance then you will have to continue shooting with your dominant hand and settle for one of two shooting methods...

1. Shoot with both eyes open and learn to account for a greater degree of parallax
2. Shoot with your dominant eye closed and sacrifice some stability
3. Use tape or other device on a lens of a pair of glasses to inhibit the dominant eye
4. Use a sight instrument (note: may degrade ability to shoot instinctive over unknown distances).

Competitive archers are more inclined to make the change. It really boils down to your ability to commit and remain patient throughout re-learning cycle and dedicate time to properly perform enough repetitions to have an effect on muscle memory.

If you feel that the effort is too great and you are satisfied with learning to compensate for the parallax effect then call it good and move on by selecting a bow for your power hand. If the next summer Olympics is not in the cards for you or you do not have a personal trainer to help you through the transition then do not obsess over eye dominance. The point is, archery is a sport that is supposed to be fun, so do what is most comfortable for you and leave the ocular dominance debate behind.



Life Skills		What problems I had and what I did about them
Health	Being	Will you have to teach yourself to use the opposite hand? How long do you think it will take you to get the hang of it?

Date **Applied** _____

Approved by _____



Archery Basics

Determining and selecting proper archery equipment can be confusing for anyone who is new to the sport. With this project book we will help you understand what you need to know about archery bows and arrows.

We have no real clue how long ago it was that the first-ever bow was fired. Initially, archery bows were made from one or two materials with simple construction. But centuries later, technology and the availability of lightweight materials led to the development of different types of bows available to meet the needs of the individual archer.

To determine your proper archery equipment you have to consider the following:

1. Type of Bow - Traditional, Recurve, Genesis, Compound or Longbow
2. Draw Length - the distance from the nock to the pivot point on the grip when bow is drawn
3. Draw Weight - the weight, measured in pounds, used to bring the bow to full draw.
4. Proper Bow Size - A correctly matched bow that reflects your draw length and draw weight
5. Arrow Length - refers to the length of the arrow shaft.
6. Arrow size - refers to the spine (stiffness) of the arrow. The shaft size is always referring to the diameter of the shaft, the wall thickness of the shaft and the distance that the arrow shaft will flex before it bends or breaks.

Bows

Bow Styles in Different Types of Archery			
What kind of shooting do you want to try? (Long Term Goals)	Type of Archery	Most common bow style	Other bow styles permitted in this type of archery
I'd like to shoot in the Olympics someday	target archery	modern recurve only	none
I want to shoot on a field	target archery	modern recurve and compound	traditional longbow or recurve
I want to shoot a bow like Robin Hood	traditional archery	traditional longbow or recurve	none
I'd like to shoot on a roving course with different terrain	field archery or 3D Archery	compound	modern recurve and traditional longbow or recurve
I want to shoot targets in animal shapes	3D Archery	compound	modern recurve and traditional longbow or recurve
I want to go hunting with my bow	bow hunting	compound	modern recurve and traditional longbow or recurve



Archery Basics

The illustration below shows examples of the many bows you may encounter. In this day in age, bows are often made of wood, fiberglass and metal (aluminum or steel). While there are all kinds of shapes, the club only has: Trainers (straight limb), Recurves, Genesis & Compound bows available for member's use.

TYPES OF BOWS



Standard draw weights and draw lengths for each type of bow			
Bow Type	Draw Length	Draw Weight	Bow Size
Trainer (Straight Limb)	14-22 inches	10-15 lbs	36 inches
Longbow	25-31 inches	20-80 lbs	60 – 70 inches
Mongolian (Traditional)	24-31 inches	20-80 lbs	53.5 -57 inches
Recurve	25-31+ inches	20-25 lbs	54-72 inches
Compound	13-32 inches	15-70 lbs	33-48 inches
Genesis	15-30 inches	10-20 lbs	35.5 inches

Descriptions for each type of bow:

Trainers (straight limb) bows, Mongolian and Longbows - are of the simplest bows made, (no gimmicks are attached). Commonly referred to as simply a stick and string these bows are for the traditional archer. With the majority of these types of bows the idea is simple: you draw the bow (pull the string) by exerting force, then hold the draw while still exerting the same force that was needed to pull the string, lastly you aim and shoot - you either have a good mind for instinctive aiming, or you miss.

Trainer bows usually are lightweight and have low draw weights and draw lengths, usually available for the youngest of archers or archers who have to develop upper body strength. They are what they are named, trainers for the novice. Most novice archers move quickly out of these bows with regular practice.

Mongolian bows are fast and powerful, ideal for target, hunting or mounted archery. The ancient Mongols developed this style with its distinctive bridge on which the string rests. The string gets a little extra "pop" when it snaps against the bridge, translating into higher arrow velocity and power.



Archery Basics

Longbow is named after what it looks like (and what it has looked like for the past 11,000 years minimum)... Most Longbows are very simple constructions, with wood being the prevailing material used in their manufacturing; they are quite tall, often measuring as much as the archer himself! If you're a novice, you should probably stay away from the Longbow, as it is very difficult to aim properly (no sights, no dampners, nothing). Longbows have a smooth full and flat trajectory, some archers feel it offers steadier, more accurate shooting however they don't have arrow rests like the more advanced bows do; instead, they have what is called a shelf, and shooting from it is often referred to as shooting "off the shelf". It's this absence of a proper arrow rest that makes the Longbow difficult to shoot.

Recurve - A recurve bow gets its power from the unique curve at the limb tips, a design first developed by Egyptian archers thousands of years ago, the design this gives a smoother draw and added speed to the arrow. This curve is very precisely calculated by the producer, resulting in a more efficient power-transfer across the entire structure, as a result, faster arrows being fired. That means more penetration and the ability to hit targets at a greater range. Recurve bows guarantee the perfect balance between traditional archery and more advanced pieces of equipment.

Manufacturers use a wide variety of materials to produce their recurves, ranging from hard wood to metal. One thing remains constant though in practically all modern recurves - the limbs of the bow are covered with a layer of fiberglass, providing the parts with more durability.

Recurves can be one solid piece, but most competition recurves on the market today are known as "takedown" recurve bows. This means that once unstrung, the bow will break down into three parts to allow for easy transport and adaptability.

Compound - (2 and 4 wheel) these bows are the fastest and easiest to hold at a full draw. Developed in Missouri by Holles Allen in 1960, the compound bow was primarily a successful attempt at improving the already-solid recurve. The compounds have what are called "cams," which are basically pulley systems located near the tips of the bow and which serve to relieve the archer of as much work as possible when aiming the bow in a drawn position. Compound bows are very much treasured by hunters, who often spend a lot of time with their bow drawn, so any amount of relief they can get is most welcome. Most compound bows are shorter than long bows and recurves, measuring between 33 and 48 inches most of the time. It "lets off" in a draw weight of 20% to 85% from its "peak" weight to its holding weight, so one can have 60 pounds of power, but is actually holding close to 30 pounds, depending on the percentage.

What is the difference between a compound and a Genesis™?

Many novice archers shoot their first arrows with a compound-style Genesis™ bow. The Genesis™ is different from a compound bow in that it has no specific draw length or let-off. Once the string rolls over the cams on the initial draw, the draw weight will feel constant through the rest of the shot. There will also be no "stop" in the length of the draw.

There may be some advantages to beginning with this style of bow:

- ❖ Low draw weight reduces the possibility of injury
 - Unlike a normal compound, Genesis™ bows have no specific draw length or let-off point.
- ❖ No specific draw length allows archers of all sizes to use the same bow, which is great for families
 - Durability means the bow may have fewer maintenance issues



Archery Basics

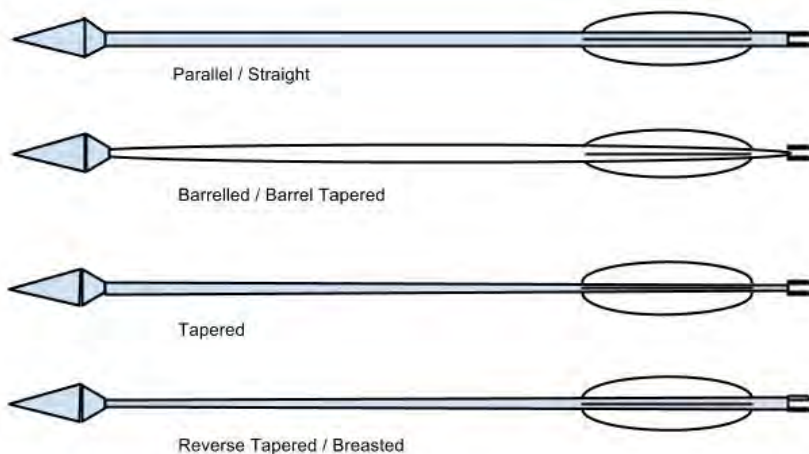


Some people don't consider crossbows to be a bow. The good thing about crossbows is that it enables you to draw the string, load the bolt and fire it, without having to exert almost any force. Why is this good? Well, if you are a person who doesn't have strong muscles and / or for some reason has trouble performing physically demanding tasks. A crossbow would be great for you. Hunters often use this bow.

Arrows

Later in this project we will cover the different parts of the arrows and their importance as well as their uses. It is essential arrows be treated with the same technical importance as bows when determining proper equipment. Knowledge is key....you should know that every one of the Sporting Goods stores, dealers and archery shops are regulated by territories. Manufacturers of big name brand archery equipment only allow their product to be sold by an individual outlet within a region. When you walk into an archery shop/sporting goods store that sells archery equipment you will now quickly recognize what brands they are allowed to sell. This scenario breeds a false sense of brand loyalty and limits you when shopping for the bow and arrows that fit you.

Here is a drawing of the most common types of arrows.



Parallel/Straight is what we mostly use as a club.

Arrows are made of different materials such as aluminum, carbon fiber and wood.

There are many vanes/feathers, nocks and points that are interchangeable depending on the purpose of the arrow's flight pattern - be it for hunting or target shooting.

The smaller archery shops see so few new customers on a regular basis that they automatically presume that everyone who walks through their door is an uneducated consumer. So your job is to educate yourself because it is in your best interest. Most of the salesmen just want to make a sale, and the more expensive the better.

Archery equipment is specifically fitted for each individual. If the bow is too small/large or has a short/long draw length you won't have proper form, also if your recurve bow is oversized then you're unlikely to realize the full stored energy and benefits of the bow and arrow. If you have an oversized compound bow it will be impossible to land at the proper anchor position and you will not be able to shoot effectively.



Archery Basics

These are just a couple of the real reasons that you must select proper archery equipment that fits you...and only you.

The impulse buyer will lose this game almost every time!

What are the most common mistakes that novices will make?

They will purchase a...

- Bow with a draw weight that is too heavy (Over-Bowed).
- Compound bow that cannot be adjusted to fit the archers draw length.
- Recurve bow that is too small (Limbs stack and archer cannot reach the anchor point).
- Recurve bow that is too large (Archer cannot achieve the desired power stroke).
- Right handed bow when they needed a left handed bow.
- Set of arrows that are over or under spine.

Advanced engineering has maximized the performance of the modern bow and new manufacturing processes have allowed this new high-tech equipment to become more readily available for everyone.

Archery should be a fun and relaxing recreational pastime with friends or an exciting and rewarding day of competition.

If it is neither one, then the time and money invested is a total loss.



Life Skills		What I learned?, Future Plans, Project Accomplishments
Head	Managing	What are some considerations needed to choose the proper archery equipment?
Head	Thinking	Should you start learning with a compound bow or a recurve bow?
Health	Being	What could happen if you select the improper size equipment?

Date **Shared** _____ Approved by _____



Draw Length

The process of finding your true draw length is not rocket science but getting it correct is vital to your success. It is impossible for an archer to learn proper archery shooting form if the draw length and bow size are too small.

The following applies to both compound and recurve archers: Before you can identify proper bow size you first need to determine your proper draw length. Conversely, if the bow is too large for the archer then you will be missing out on the full potential of the stored energy for the bow and the compound shooter will not be able to anchor at all because the nock point will be located too far behind the face.

Proper full-draw-position requires that the archer stand erect, shoulders level, the bow arm extended (no bent elbow) and the drawing arm/elbow in line with and behind the arrow. This is easy to check from behind the archer's elbow as shown here

There are several methods for determining draw length, the preferred and most accurate method is to draw an arrow.

True Draw Length

Mark your longest arrow for a quick and easy way to identify measurement

1. Identify a bow that is similar to the style preferred and of similar draw length to your draw.
2. Draw the bow several times using any release aid to determine the proper anchor.
3. Archer should draw the measuring arrow to full-draw position read the measure from the nock on the string to the grip pivot point or arrow rest mounting hole (they usually match)



The distance between the mark and the recess in the arrow nock is the true draw length and from this you can find the ATA Draw Length by adding another 1 3/4 inches.

In the illustration below is an example you can see that the draw length is 27.5 inches.

$$\begin{aligned} \text{ATA Draw Length} \\ 27.5 + 1.75 = 29.25 \end{aligned}$$



Draw Length

If you do not have access to a bow then you can use the measure and divide method to find your calculated draw length. The next two methods for calculating draw length are listed below:

1. Calculated Draw Length
2. ATA Draw Length Standard

If you are selecting your first bow then finding your calculated draw length (Calculated Draw Length method) is sufficient enough for identifying your proper bow size if you follow these recommendations. Using ATA Draw Length Standard method will assure a more precise measurement but again, either method is adequate for new archers. Note that the two methods apply for youth and adult archer's alike.

Calculated Draw Length

This process is fast and easy and it works great for both compound and recurve archers. To determine your calculated draw length you will use a tape measure and some simple math. No rocket science required for this method, but you will need two assistants to help you measure.

Step 1

- Stand up straight and make a T with your arms reached out and palms open (facing forward)
- Make sure your shoulders are not scrunched up or the chest over extended
- Just stand natural and relaxed otherwise you could affect the measurement
- Now have your assistants measure with a tape measure from the tip of one middle finger to the tip of the other middle finger.



An alternate method determining your proper draw length is:

- Stand with your back against a wall
- Have your assistant mark the location of arm span on the wall with a pencil or tape.
- Place the marks on the wall to indicate the end of each middle finger.
- Then simply measure the distance between the marks on the wall.
- Record this measurement as "Arm span".



Draw Length

Step 2

Divide your arm span measurement by 2.5.

This example is based on an Arm Span measurement of 52 inches.

The answer will be a calculated draw length.

In this example it is 20.8 inches.

Of course your actual results will be different from my example.

Suggestion:

Round-up your calculated draw length to the nearest 1/2 inch.

For instance, in this example the calculated draw length will be 21 inches.

Record your calculated draw length number.

Measure and
Divide Example Arm
Span = 52 inches
 $52" \div 2.5 = 20.8"$

Remember, your calculated draw length is enough information for a new archer to select a proper bow size. You can use your Calculated Draw Length and move on to the next step to find your proper size bow.

ATA Draw Length Standard

(ATA - Archery Trade Association)

ATA assists in establishing measurements standards within the archery community.

According to ATA...

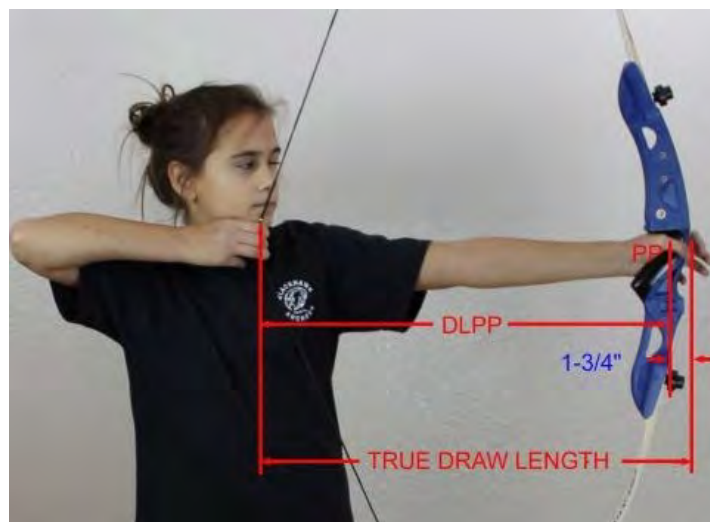
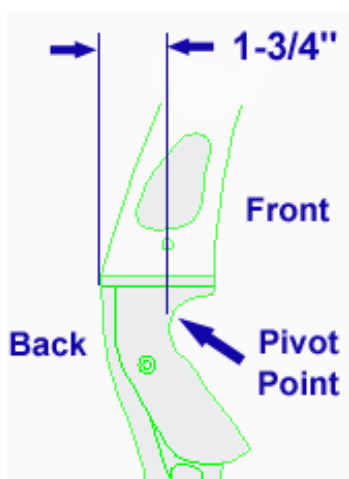
Draw length is the distance at the archer's full draw, from the nocking point on the string to the pivot point of the bow grip plus 1 3/4 inches.

Draw Length (DL) from the Pivot Point (PP) shall be designated as DLPP and shall be called TRUE DRAW LENGTH.

It sounds confusing but it is quite simple.

Here is how it works...

1. The archer will draw the bow to the proper anchor position
2. Your assistant will measure from the Nock Grove (apex of the string) to the Pivot Point (PP) of the bow grip
3. Now add 1-3/4 inches to that distance





Draw Length

Here is a tip that makes finding the ATA true draw length even easier.

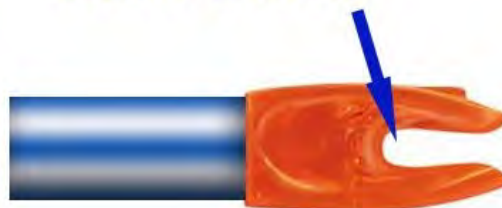
A great deal of modern day bows are manufactured with a distance of 1-3/4 inches from the pivot point to the back of the bow. So, if you are using a bow that is 1-3/4 inches from the pivot point to the back of the riser all you need to do is measure from the nock groove or nock point at full draw to the back side of the bow to find true draw length.

Where is the Nock Grove?

The nock groove is the part of the arrow that snaps on to the bowstring.

It is important to note that the portion of the nock that extends past the string is not included in the measurement.

Nock Grove



Important Tips:

For either method, if the archer being measured does not have proper shooting form then they WILL NOT achieve proper full draw and anchor position. Consequently you may not identify your True Draw Length. When using these methods, it is important that the archer:

1. Does not raise or scrunch up their shoulders.
2. The chest should not be collapsed and the elbows and arms need to be properly aligned to the arrow shaft or you will get false readings.



Many archers draw short of the proper full-draw-position. Here the draw-side elbow is not rotated behind and inline with the arrow resulting in the archer's holding the bow with his/her arm instead of the back muscles. In this position the drawing arm never gets to relax and releasing the arrow is inconsistent at best – it fails under pressure!



Some archers overdraw the bow. In this position, the drawing elbow is rotated beyond the line of the arrow so that the back muscles needed to hold and execute the shot are compressed and not fully useful. Once again, shooting with this posture produces inconsistent results.



Life Skills		Completed?	What I learned?, My leader/parent/guardian helped me
Health	Being		What happens if the bow is too short for you? How will you know?
Hands	Working		Can you find your True Draw length by yourself?

Date Processed _____

Approved by _____



Draw Weight

Regardless of your age, gender, body type or willingness to learn; selecting the proper draw weight is important and again, the learning experience is hampered if you are over bowed. Both recreational archers and competitive archers simply want to shoot their best game or highest score.

Below you will find the recommended draw weights for Recurve and Compound bows. Use these as a starting point to determine your proper draw weight.

Recommended Draw Weight for Recurve Bows

For Beginner Recurve Bows	
Youth (Age 8 to 10)	10 - 12 pounds
Youth (Age 11 to 13)	10 - 14 pounds
Teens (Age 14 to 17)	12 - 16 pounds
Young Adults (Age 18 to 20)	16 - 22 pounds
Adult Women	16 - 26 pounds
Adult Men	22 - 28 pounds

For Intermediate Recurve Bows	
Youth (Age 8 to 10)	10 - 14 pounds
Youth (Age 11 to 13)	12 - 18 pounds
Teens (Age 14 to 17)	16 - 22 pounds
Young Adults (Age 18 to 20)	18 - 26 pounds
Adult Women	22 - 32 pounds
Adult Men	26 - 38 pounds

Included beginners who are athletically inclined with better than average upper body strength

Recommended Draw Weight for Compound Bows

For Beginner Compound Bows	
Youth (Age 8 to 12)	10 - 16 pounds
Teens (Age 12 to 14)	14 - 22 pounds
Older Teens (Age 15 to 18)	24 - 28 pounds
Young women and male teens	26 - 36 pounds
Women - above average strength & younger males	30 - 40 pounds
Average Man	40 - 50 pounds
Men & Women with above average strength	40 - 60 pounds

For Intermediate Compound Bows	
Youth (Age 8 to 12)	18 - 22 pounds
Teens (Age 12 to 14)	24 - 30 pounds
Young women and older male teens	30 - 40 pounds
Women - above average strength & younger males	40 - 50 pounds
Men & Women with above average strength	50 - 60 pounds

You may be asking yourself why draw weight recommendations are relatively low? There is a really fine line between too heavy of a draw weight and one that is too light. If there is not enough draw weight it could make it difficult to learn from the archer's perspective. Draw weight depends on the individual's strength and motor skills. There is no magical answer to selecting the ideal draw weight for any given individual. The following are only estimations for what may be good starting points.

We will spend a great deal of time training with light weight bows. We are not focused on the results down range at the target so much as we are focused on proper body alignment and execution. As the archer becomes more proficient we slowly increase the draw weight. Depending on the individual we may go up 2 pounds or we may go up 4 pounds.

There are many more factors that will determine how you will progress through draw weight increases.



Draw Weight

Avoid Being *Over Bowed* For True Success

Over bowed means an archer cannot draw the bow back to the anchor position without *skying* the bow - which means aiming the bow up into the air. This is dangerous. Not just to the archer performing the act but to everybody within reach of the projectile.

There is a philosophy that a new archer should start at the draw weight that they intend to shoot for the next 3 or 4 years. This almost always leads to the archer being *over bowed*. In this scenario, the instructor will not be able to correct biomechanical misalignments and the archer will only be able to tolerate very short training periods. If the archer happens to be very young and has not fully developed or lacks upper body strength it will lead to a great deal of discomfort and will soon become discouraged.

More reasons why proper draw weight is important...

If you are *over bowed* you cannot achieve the proper bone and muscle alignments that facilitate good form and shot execution. Secondly, if your bones and muscles are aching after shooting only 6 to 12 arrows then you cannot possibly work on developmental skills that result in a tight and accurately placed arrow group. If you are *over bowed* it is very unlikely that you can draw the bow, set your anchor and hold while you acquire your target, aim then release and follow through without your muscles quivering. Under these conditions it is extremely tough to have fun. If the *over bowed* archer is not *skying* then they are going through some amazing physical contortions in order to overcome inertia and to leverage body weight and muscle to perform the task. Below is a guide that will help gauge where to begin and how much time it will take to progress. Most competitive archers will progress quicker through this chart.

You can easily identify an over bowed archer because they...

- ✓ Will be the ones arching their back to overcome the high draw weight
- ✓ Are the archery contortionist with poor form and execution
- ✓ Are typically inconsistent shooters
- ✓ Are the ones who can only shoot a few arrows before they are in pain

Age	School Grade	Recommended weight
8 - 9yrs	3rd	10-15 pounds
10 - 12 yrs	4-6th	15-22 pounds
13 - 15 yrs	7-9th	25-30 pounds
16 - 18 yrs	10-12th	35-40 pounds +



Life Skills		Completed?	What I learned? Improvement of Skills
Head	Managing		What do you believe is the proper draw weight for you at this moment? Date the answer below to see your progress.

Date **Applied** _____ Approved by _____



Bow Size

The process of identifying your proper bow size for archery only takes a few moments but some folks make it look like rocket science. In reality it only takes 5 to 10 minutes, what will take time is getting used to that bow.

If you do not already know your calculated draw length, go back to those pages to understand the process. If you already know your calculated draw length you can move on to selecting the appropriate size bow.

The following chart is for recurve bows. Match your calculated draw length to the appropriate bow size. Round the calculated draw length up to the nearest 1/2" inch for recurve bows. It is preferable to shoot a longer bow than one that might be too short.

Calculated Draw Length = Bow Size:

14" to 16" = 48" Bow
17" to 20" = 54" Bow
20" to 22" = 58" Bow
22" to 24" = 62" bow
24" to 26" = 64" to 66" bow
26" to 28" = 66" to 68" bow
28" to 30" = 68" to 70" bow
31" and longer = 70" to 72" bow

For Recurve bows it is important to match your bow length to your draw length, the bow will feel smoother and arrow speed will be maximized. Bow limbs are designed to be used at a particular draw length range. If you use a bow with limbs too long for your draw length (for example you have a 26" draw length and use a 70" bow), you won't be flexing the limbs enough to make them efficient for your draw. If the bow is too short, then you will pull it so much you will nearly pull it in two. The goal is to obtain a bow so that your arm length will, when fully pulled, flex the bow enough to deliver the power to the arrow but not too much so as to over stress the bow. Usually the arrow length for a 5' 10" man is about 27-29" and therefore needs a bow length of 66-68" for target archery.

Compound bow archers will know what their bow size will be when determining their draw length and draw weight. Modern compound bows available on the market

and within our club, indicate the range of draw lengths and draw weights on the bow. This is why each bow is customized for each person and only you should be shooting the bow that is assigned to you.

DRAW TO FULL-DRAW THEN SHOOT

It's important to note that compound bows are designed to be shot only from the full-draw position (whatever that mechanical setting may be). If a compound bow is set for a 29" draw length, for example, it should always be drawn back to a full 29" and then shot from that position. You don't shoot from the middle of the powerstroke - you only shoot after the bow reaches its full draw. If you haven't shot a compound bow before, don't worry. It's much easier to "feel" than explain. You draw the bow back until you feel the mechanical stop - then you take aim - then you shoot! Easy.



Equipment Recommendations

First and foremost before purchasing equipment, please understand you can use what we have for the club first at least until you get the “hang of this”, and you have tried the different bows at your disposal. If you are properly equipped you should be able to execute the shot without discomfort and more likely to rapidly advance your skills as an archer. After some time you will want your own equipment and for when you do here are some recommendations.

Know Yourself...A good coach, instructor, a salesman or the guy behind the counter at the local pro shop should be asking you some questions about your archery experience before they make any recommendations.

If they are not asking questions like the ones below...buyer beware.

- ❖ What is your experience with archery?
- ❖ Are you actively involved in other sports?
- ❖ If your only archery experience was a one day or a weeklong camp, what did you learn?
- ❖ During camp, what size bow and what draw weight was provided?
- ❖ If you are involved in an ongoing archery program or receiving lessons, how often do you shoot?
- ❖ Did your instructor or coach make a recommendation for draw weight?
- ❖ If you are using loaner or rental equipment during lessons, what size bow and what draw weight are you using now?
- ❖ What are your goals for archery? Do you plan on competing?

If you purchase a take-down style recurve bow and you find the weight to be a little too heavy, the odds are you can purchase a separate pair of lighter weight limbs. Use the light weight limbs for practicing good shooting technique. In time the muscles will grow and motor skills will allow the archer to step up to a heavier limb. Check with merchant to see if limbs are interchangeable.

Maybe mom and dad haven't had the time to shop around for the right equipment. Maybe the local pro shop convinced them they knew better and they need what they are selling them. Or maybe it was just an impulse buy. Know this, if you go to any sporting goods dealer and you already know what you want or need, do not let them sell you something just because that is all they happen to have in stock. Be patient - call around and do not forget to check online dealers if you cannot find your archery equipment locally.

Your job is to research the equipment that you need for your bow, be that by internet searches or by talking to your instructors. It may even get you additional brownie points with your parents and instructors if you do the research and show them your work. The quality of your learning experience is in direct proportion to the archery equipment and setup as well as the quality of the instruction or coaching. Remember it is not always important to focus on the equipment - For anyone just starting out in archery it is more important to focus on:

- Having Fun
- Learn Proper Technique
- Continue to improve your shot execution/groupings



Arrow Length

Believe it or not, proper arrow length for anyone beginning in archery is one of the most important pieces of safety equipment. If you don't have the correct arrow length you are putting yourself and others in personal danger. Secondly, if you don't have the correct arrow size (spine) you will increase the risk of an accident by tenfold.

Wait - What is the difference between arrow length and arrow size?

Before we get in to the method for finding your proper beginner arrow length, let's clear the air as it relates to arrow length and arrow size.

Arrow Length - refers to the length of the arrow shaft.

Arrow size - refers to the spine (stiffness) of the arrow. The shaft size is always referring to the diameter of the shaft, the wall thickness of the shaft and the distance that the arrow shaft will flex before it bends or breaks.

Before you determine your beginner arrow length it is equally important to understand some basic shooting form errors that will give you a false reading for archery arrow length.

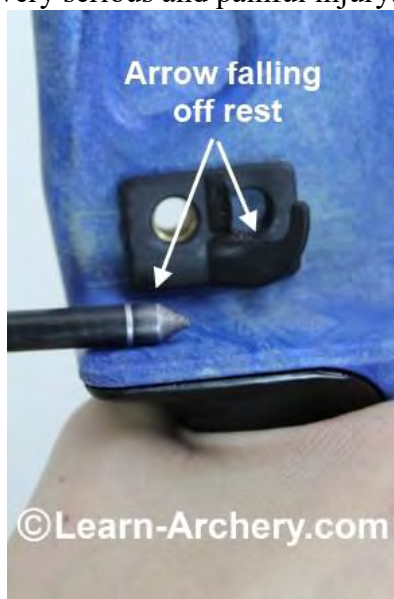
Differences between incorrect and correct posture and form will be featured at the end of this section to help assure you get the correct information the first time.

One important factor you need to embrace right now is that not all arrows are alike and your arrow length is specific to your needs only. Shooting someone else's arrow or any arrow that was not properly sized to your specific needs is a bad idea...particularly if the arrow is too short.

WARNING

Drawing an arrow that is too short will result in the arrow falling off the arrow rest and possibly being shot into the back of your hand. Arrow Too Short!

In the photos below the point of the arrow is going to fall off of the arrow rest if the archer "over-draws" the bow. What happens next can result in very serious and painful injury.





Arrow Length

What is the proper way to size archery arrows for a beginner?

To start the process for determining your beginner arrow length, follow any of the simple procedures outlined below and you will know what size beginner arrow length you need in a jiffy.

Note: There are other more precise methods to determining proper arrow length but they are for experienced and advanced archers.

Before you can determine your proper beginner arrow length, you will need an assistant to mark the arrow for you.

You will also need one of the following measuring devices to determine your beginner arrow length:

1. Tape measure or
2. Fabric Tape measure
3. Some type of marker (preferably a Sharpie ®)

Method 1 - Beginner Arrow Length

The best method of determining correct archery arrow length requires a bow with a light draw weight and an extra long arrow.

You will also need an assistant with a marker to help you.

NOTICE: All of the methods discussed on this page for determining proper arrow length are for arrows that will use target or field points. DO NOT use any of the information on this page for arrows that will use broadhead or any other hunting tip or device.



Step 1

1. Start with an arrow that is known to be extra long (3 to 4 inches longer than your reach.
 - a. Check the arrow first by placing the knock on your breastbone and between your outstretched arms and palms. Make certain there is at least 2 to 3 inches of arrow shaft extending past the finger tips.

The purpose of using an extra long arrow is to be certain there is no risk of the arrow falling off the arrow rest if the bow is overdrawn.



Arrow Length



Step 2

Draw the arrow and anchor under the chin or with the index finger in the crook of the mouth.

Alternatively you can use an anchor position where the index finger is placed under and against the jaw bone as shown in the image below.

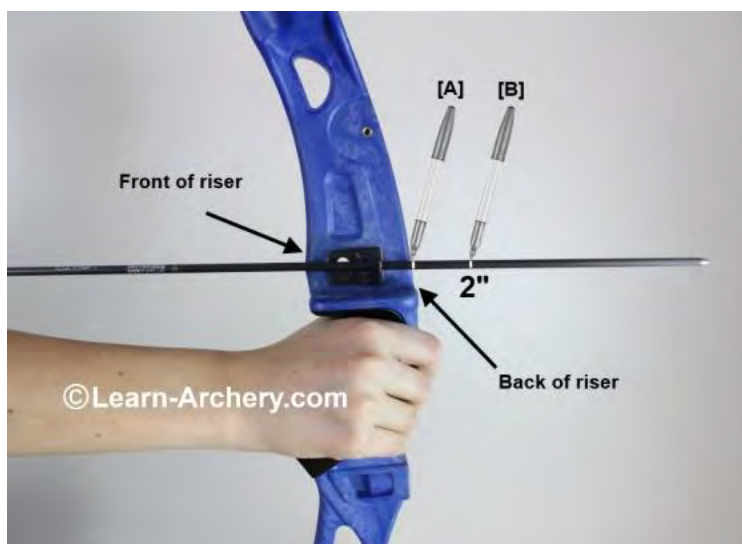
- Make certain you are using good posture and that you are not overdrawing the bowstring
- You will need to **HOLD** this position while your assistant carefully marks the arrow shaft

Step 3

While you are at full draw and "HOLDING" have your assistant mark the arrow shaft where it meets the back of the riser [A].

NOTE: It is highly recommended that you use a bow with a low draw weight so you can safely draw, anchor and hold the arrow without becoming fatigued.

ATTENTION: Make sure your assistant is standing behind the arrow flight path!!!



- Archers who have little experience but shoot with relatively good form should mark the arrow even with the back of the bow riser.
- Beginners with no experience are advised to make the arrow at least 2" beyond the back of the bow riser for added safety [B].
- Carefully let down the arrow when your assistant is safely behind you.
- Remove the arrow and measure the distance from the nock groove hole to the mark you just made.

Experienced archers can mark the arrow even with the back of the riser [A]. New archers should add at least 1-1/2" to 2" to the length [B].

Entry level archers who have had formal instruction and shoot with good form and posture can use the distance from the nock groove to first mark [position A].

Beginners with no formal instruction and no experience will add 2" (50.8mm) [position B].



Arrow Length

Note that the point of the arrow or tip is not included in the arrow length.

This measurement that you obtain is your new proper beginner arrow length (arrow shaft only).

Method 2 - Beginner Arrow Length



This technique for determining your beginner arrow length only requires a tape measure and an assistant.

Step 1

Start with the proper stance and anchor position with the bow arm extended out to your side.

Step 2

While holding the end of the tape measure (pinched between index and middle finger) have the assistant stretch the tape out to the end of your thumb.

Step 3

Point the thumb of the bow hand toward the imaginary target without turning the wrist.

Step 4

With your thumb stretched outward (toward the imaginary target) make a note of the distance to the end of the thumb.

Step 5

From the end of the thumb add one inch (1") (25.4mm) to the measurement.





Arrow Length

NOTE: A compound archer will have a different anchor position depending on the type of release mechanism they use but the method for finding their beginner arrow length is the same.



Compound bow anchor position

The measurement you obtain is your beginner arrow length for the shaft only,

Again, note that the arrow point is not included in the measurement.

The distance you come up with is for the "arrow shaft length" and NOT the total arrow length.

In the end, your arrow should extend past the thumb a minimum of 1.5 inches for safety.

Pretty simple isn't it? That's really all you need to know to determine proper archery arrow length for beginners.

Both methods work and the important piece to remember is that a beginning archer should always start with an arrow length that is longer than the actual draw length for safety reasons.

Until your shooting technique is developed including proper shoulder and bow arm elbow alignment and you are certain that you will not overdraw the bow, stick with an arrow length that is long.



Life Skills		Completed?	What I learned? Improvement of skills
Head	Thinking		How long do your arrows have to be to be considered safe to shoot as a beginner?

Date **Processed** _____

Approved by _____



Arrow Size

Modern archery is a technical sport. So there are a number of technical considerations to juggle when selecting arrows: proper spine, FOC balance, weight, straightness, fletching material, fletching angle, arrow length, etc. And if you're feeling a bit lost, don't worry, this isn't exactly rocket-science – there are guides to selecting the proper arrows, we can help you locate those guides.

We won't go into too much on Arrow Size, just a few points:

- The industry standard measurement for weight is grains per inch (GPI). There are many factors that make up GPI including: *arrow diameter*, wall thickness, and shaft material. The GPI weight of listed arrows does not include the weight of the point, nock, insert or fletchings.
- One example of some arrows that are used in the industry are aluminum shaft arrows: The four-digit number on the label refers to the outside diameter and wall thickness of the shaft. The first two numbers are the outside diameter in 64ths of an inch. The second two numbers are the wall thickness in thousands of an inch. For example, a 2514 shaft would be 25/64th of an inch in diameter and .014 of an inch wall thickness. OD (outside diameter) and wall thickness are the two variables in controlling spine for aluminum arrows.

Understanding the arrow size will help with fine tuning the shot so this information really is most important to competition shooters, especially hunters and Olympic archers.

It is very important as an archer however to understand the parts of an arrow and how they relate to arrow size.

PARTS OF AN ARROW

The parts of a modern hunting arrow are pretty straight forward here is some arrow jargon.



The foundation of every arrow is the SHAFT, a long hollow tube usually made of aluminum or carbon/graphite composite materials. The rear of the arrow is fitted with a small piece of molded plastic called a NOCK, which allows the arrow to physically attach to the bow's string. At the front of the arrow is a small aluminum (sometimes plastic) sleeve called an INSERT. The insert gets glued into the end of the shaft and provides a threaded hole in which to screw in the arrow's TIP. A tip doesn't necessarily have to be a practice point (as pictured here). A standard insert allows you to screw-in and use of a variety of tips in the same arrow (broadheads, judo-points, blunt-tips, field points, fishing tips, etc.). The last component is the arrow's FLETCHING. The arrow's fletching is usually done with colorful parabolic shaped pieces of soft plastic (vanes) or feathers. In most cases, the three fletches are glued onto the shaft in an equally spaced circular pattern, with two fletches one color (the hen-fletches) and the third fletch a different color (the cock-fletch).



Arrow Size

Spine is very important when it comes to tuning, shooting and grouping your arrows. If you do not have the correct arrow spine for your bow set up, you are going to get erratic arrow flight and poor shooting groups. Having the proper arrow spine is key to optimizing the grouping of your arrows and for the best possible accuracy. Once you are ready for competition shooting then you can ask for additional help on choosing the correct arrows for your bow.

There are two different types of spine – STATIC spine and DYNAMIC spine.

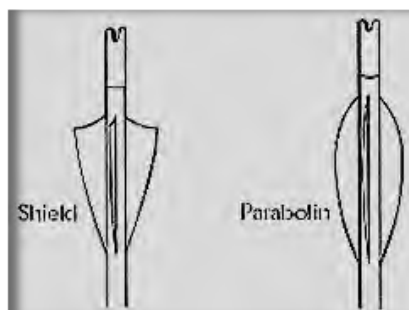
STATIC spine is measured by the amount of flex in the arrow when an 880-gram (1.94 lbs.) weight is suspended from the center of the arrow. The arrow must be 29" in length and supported by two points, which are 28" apart. The number of inches the arrow deflects or bends due to the weight, is the spine size or measurement of an arrow.

DYNAMIC spine describes the way an arrow reacts from the stored energy of a bow as it is shot. Several factors determine the way an arrow is going to react when shot out of the bow, including method of release (fingers or mechanical release), amount of energy applied by the bow, the bow's cam system (single, round wheel, hard or soft), weight of the arrow, spine of the arrow, length of the arrow, point weight, nock weight and fletching weight. Even nock set material (traditional brass nock or serving nock), along with string and serving material can influence dynamic spine. Because of the nearly unlimited variables in determining dynamic spine, arrows are usually measured using static spine.

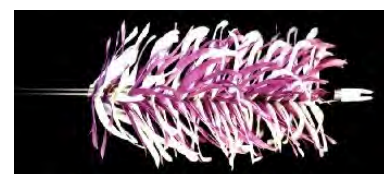
Fletchings/Feathers

Feathers determine stability and amount of noise while in flight.

There are so many different kinds here are pictures of those that are more commonly used.



Example of type 1 Flu-Flu fletching



Example of type 2 Flu-Flu fletching

What type of arrows should I use?

The choice between aluminum, carbon or aluminum/carbon products depends on the experience and shooting style of the archer. While there are some true advantages and disadvantages of each design, ultimately this decision is personal preference.



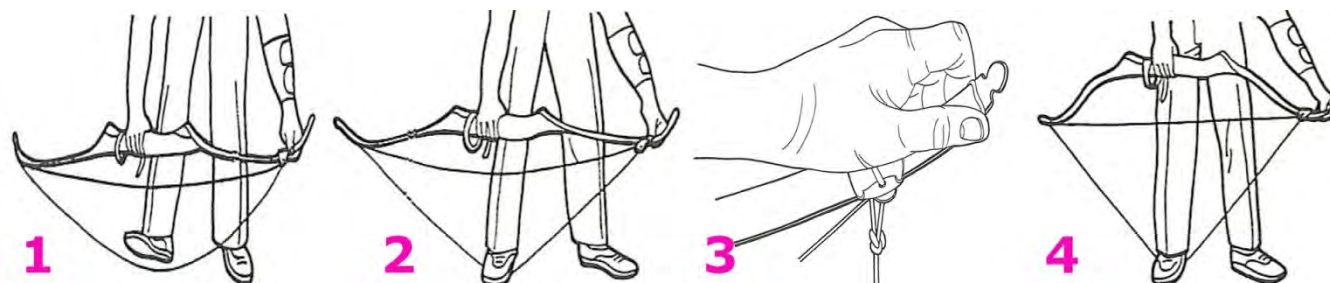
Life Skills		Completed?	What I learned?
Head	Thinking		Why are there two different colors on arrow fletchings?

Date Processed _____

Approved by _____



Stringing a Recurve Bow

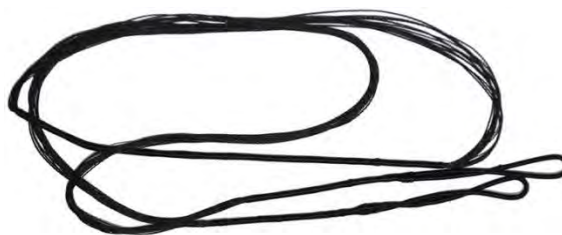


Incorrect stringing methods can result in archer injury from the recoil of the limb if control is lost during the stringing process, or incur damage to the bow in the form of twisted or splitting the limbs due to misaligned pressures. There are many methods of stringing (bracing) a bow like we do out on our field but when you are away from our field this is an acceptably safe way to string/destring your recurve bow.

The Bow String

The modern bow string is made from a number of strands of either Dacron or non-stretch material.

Modern bow strings are made from a number of strands of bow string material; the ends are bound into loops which fit onto the bow's nocks (notches) on the ends of the bow limbs.



Usually the top loop is larger than the bottom loop as the top loop needs to be slid down the bow limb for storage and stringing of the bow. The larger top loop makes it easier to identify the top and bottom of the string which is important when stringing a bow. The center of the string is bound with serving which protects the string from wear. Nocking points are fitted to the serving to provide a consistent point to place the arrows prior to shooting.



The Bow Stringer

A bow stringer is a device designed to string bows. Bow stringers come in two basic designs, double pocket or saddle. Both types have a strong nylon cord which has on one end a large leather (or rubber) pocket which fits over the bottom limb tip and at the other end, in the case of the "Double Pocket Type", a smaller leather or (rubber) pocket or in the case of the "Saddle Type", a saddle made of rubber or leather having a dimpled rubber surface.



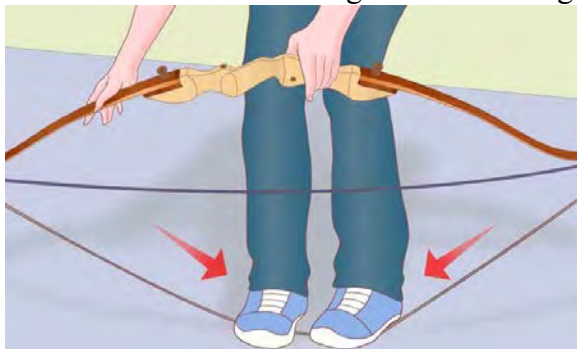
Stringing a Recurve Bow

With both styles of bow stringers, the larger pocket fits onto the bottom limb over the string and helps in keeping the string in place. The smaller pocket on the “Double Pocket” type fits over the top limb tip and allows the string to be placed into the string groove of the upper limb.

The saddle of the “Saddle” stringer fits just behind the string which should be looped around the upper limb.

Procedure to string a recurve bow

- a. First identify the top string loop and slide the top loop over the upper limb of the bow and locate the lower loop in the lower string-nock.
- b. Check the position of the bottom loop ensuring that it is located in the string groove of the limb and then slide the large pocket of the stringer over the bow tip and string the loop.
- c. While holding the bow by the handle around the grip with one hand (if using the saddle type stringer) position the dimpled saddle with the other hand
- d. Allow the cord of the stringer to touch the ground and place the ball of one or preferably both feet



onto the cord. Under no circumstances should the cord be located under the arch of the foot, as this will allow the cord to slip when the tension is taken up. It is recommended that children use both feet.

e. Take up the slack in the cord and place the thumb and index finger of your free hand on each edge of the bow limb located just behind the string loop and take up the slack in the bow string.

f. In one action draw up using the hand holding the bow. This causes the limbs to bend

downwards. At the same time, slide the string up the limb with the other hand until it engages with the string nock.

- g. Using your finger, check that the string is seated correctly in the bow nock.
- h. Step off the cord and, at arm's length, rotate the bow, string toward the body and parallel to the ground. Inspect the upper limb nock to check that the bowstring is correctly seated in the nock groove.
- i. If correct, remove the bow stringer and check that the lower string loop has not moved and is still seated correctly
- j. Now check the brace height and nocking point height before shooting.



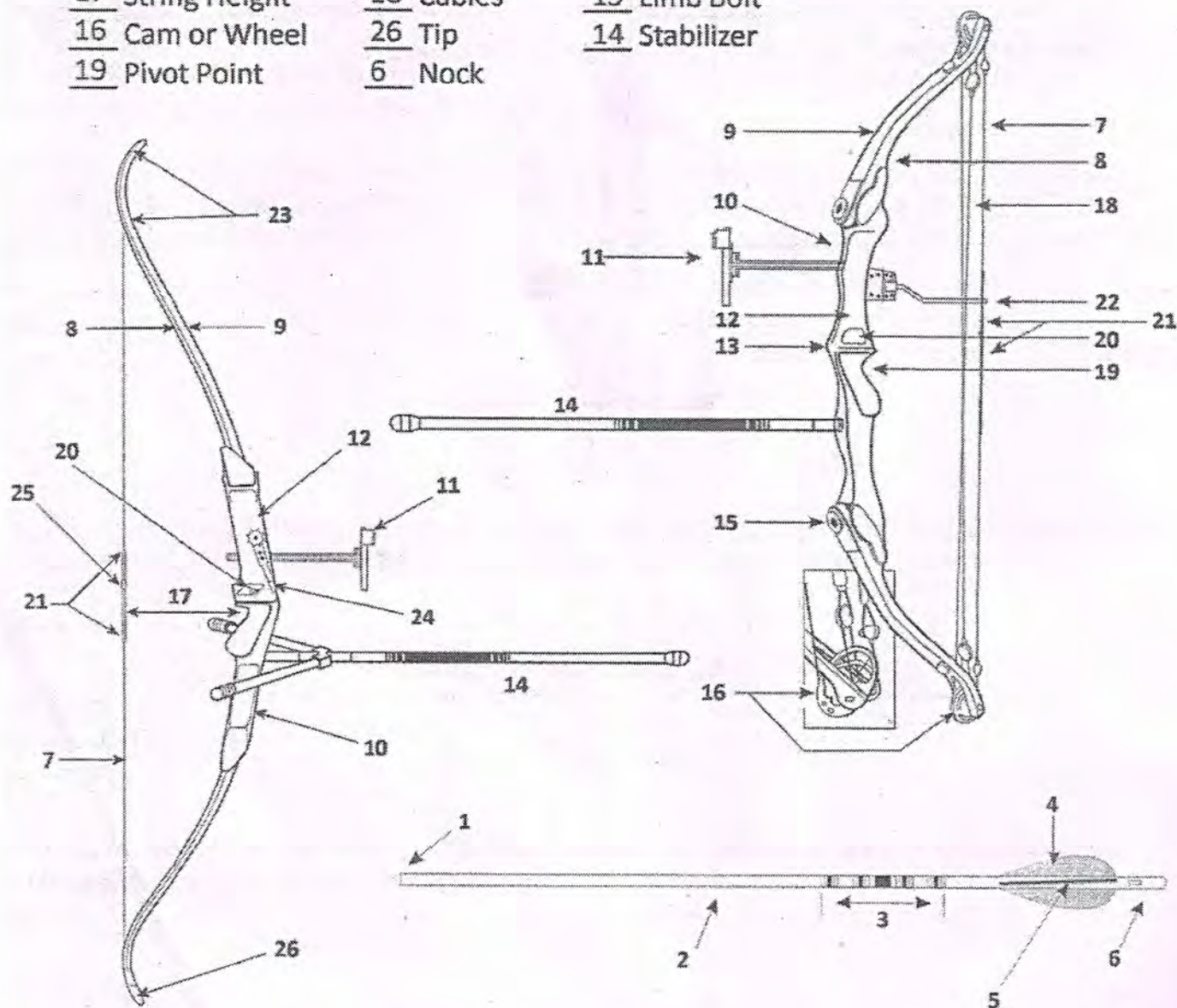
Life Skills		What I learned?
Health	Living	Why is it dangerous if the bowstring is not correctly seated in the limb nock?

Date **Generalized** _____ Approved by _____



Archery Tackle and Parts

<u>20</u> Arrow Rest	<u>10</u> Riser	<u>22</u> Cable Guard
<u>9</u> Back	<u>12</u> Window	<u>5</u> Index Fletch or Vane
<u>3</u> Crest	<u>24</u> Clicker	<u>11</u> Sight
<u>8</u> Face	<u>7</u> String	<u>21</u> Serving
<u>4</u> Fletch or Vane	<u>1</u> Point	<u>23</u> Recurve
<u>25</u> Nock Locator	<u>13</u> Shelf	<u>2</u> Shaft
<u>17</u> String Height	<u>18</u> Cables	<u>15</u> Limb Bolt
<u>16</u> Cam or Wheel	<u>26</u> Tip	<u>14</u> Stabilizer
<u>19</u> Pivot Point	<u>6</u> Nock	





Archery Tackle and Parts

Accessories



Arm Guard



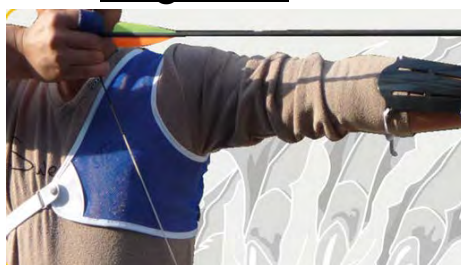
Finger Tab



Side Quiver



Finger Sling



Chest Protector



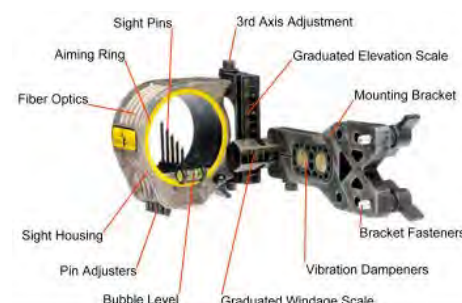
Release Aids



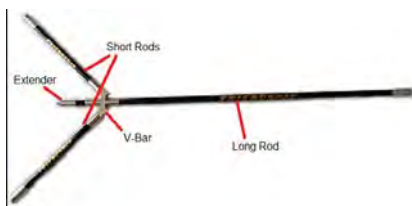
Wrist Sling



Ground Quiver



Bow Sight



Target Stabilizer



Hunting Stabilizer

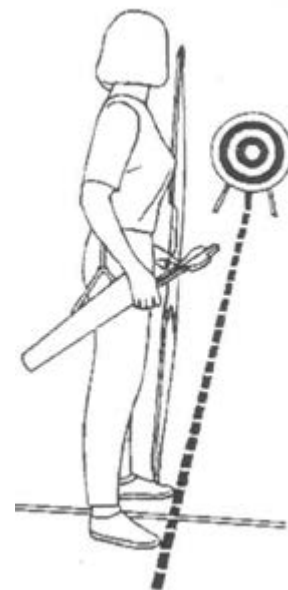


Bow Case



The Shot Process

1. Stance and Posture
2. Nock Arrow
3. Set Hook/Release
4. Set Bow hand grip
5. Raise and extend the bow
6. Draw
7. Anchor
8. Aim
9. Release
10. Follow through
11. Relax and Evaluate

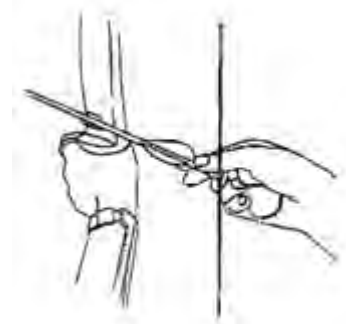


1. Stance and Posture

- A. Using the bow as a guide align to the target, imagine a direct line.
- B. Place one foot on each side of the shooting line
- C. Ensure that the same foot alignment is used every time
- D. Find a comfortable and balanced stance with the feet shoulder width apart
- E. Stand straight (head, neck, shoulders, hips and feet should be directly underneath each other for proper stance), keeping ribs and chest down, and bottom tucked under.
- F. Keep shoulders down and relaxed
- G. Knees should be locked but relaxed. Blood flow shouldn't be restricted.

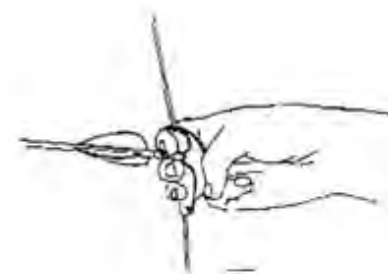
2. Nock Arrow

- A. Place an arrow on the arrow rest, holding the arrow close to the nock
- B. Point the index fletching (odd color) away from the bow.
- C. Snap the nock of the arrow onto the bowstring under the nock locator. You should hear an audible snap.



3. Set Hook/Release

- A. Set the first groove of the first three fingers around the bowstring under the arrow nock creating a hook. This is the Apache draw.
- B. Keep the drawing hand flat and relaxed.
- C. The thumb and pinkie should be tucked away.
- D. If you are using a mechanical release, set your release to the D-loop.



The Shot Process



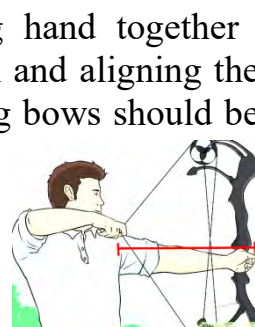
4. Set Bow hand grip

- A. Position the bow-hand on the bow grip by making a Y with the fingers and thumb.
- B. The knuckles of the fingers should be positioned at a 45 degree angle and the thumb pointed to the target.
- C. Important to understand the bow is being held by the hook/release hand, the bow hand is just for secondary support.
- D. Index fingers through the pinky should be relaxed.



5. Raise and extend the bow

- A. For recurve bows: Raise the bow arm and string hand together towards the target, while keeping the shoulder down and aligning the chest perpendicular to the target. Recurve and long bows should be partially drawn.
 - a. For compound bows: the string hand is at brace height.
- B. The drawing arm should be near level with the nose.
- C. The bow arm should be rotated so that the elbow joint is straight up and down.



6. Draw

- A. Draw the string, using angular motion, to the side of the face anchor point.
- B. Set the drawing arm shoulder back and down until the elbow is directly and a bit higher than the arrow.



7. Anchor

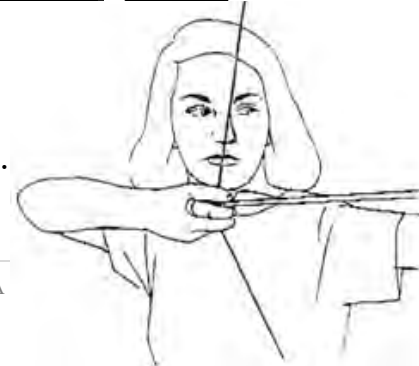
- A. Draw the string to the side of the face placing the tip of the middle finger on the corner of the mouth.
- B. Keep the hand snug against the face folding the thumb down and the little finger towards the palm of the hand. Compound bow: anchor point is different depending on the type of mechanical release



COMPOUND
STYLE

8. Aim

- A. Look at the target or through the sight. Keep focus on form.
- B. Look at the point of aim if not using a sight.
- C. If using a sight, align the sight on the point of intended impact.





The Shot Process

9. Release

- A. For finger release, relax the finger of the drawing hand while continuing to draw the bow in an angular motion using back muscles.
- B. For mechanical release, continue drawing the bow with the back muscles to accomplish the release using back tension.
- C. Continue holding the bow arm toward the target. The bow may pivot forward.
- D. The head should not move and the eyes continue looking at the point of aim until the arrow strikes the target.



10. Follow through

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



11. Relax and Evaluate

- A. Relax after each shot.
- B. Evaluate the feeling of each shot to determine if you accomplished the goal you were trying to achieve.
- C. If not, you should refocus your efforts on the feeling of the proper shot and try again.
- D. If so, repeat.
- E. Forget the shot, it is over. Concentrate on the next shot.

The shot sequence is an important technique in archery. You will strive your whole life to perfect this technique however if you follow the steps and focus your energy in it you will have success every time. This is proper form when shooting archery. Throughout your time in 4-H we will refer to this often, so memorize it and let us know when you are ready to get quizzed on it.

While you are learning the shot sequence please use the Archer's Log and scoring sheets at the end of this book to keep track of your progress and see how you can evaluate your goals.



Life Skills		Completed?	Short Term Goal, Project Accomplishments, Skills
Head	Thinking		Learn and memorize the 11 steps of the shot sequence

Date **Applied** _____ Approved by _____



Equipment Maintenance

No matter the price of your bow it's still an investment and it only makes sense to take care of the investment. The better care you take of your bow the longer it will stand up to the abuse of target shooting or hunting.

Your bow is a mechanical device and as such, is subject to wear and need of periodic inspection, adjustment and service. Pro Shops recommends that you bring your bow in at least once a year for a yearly professional maintenance and inspection. Areas to be inspected are axles, spacers, lubrication of axle bushings, "E" clips, strings, cables, limbs and riser. Remember today's compound bows shoot at speeds that were never thought of so the wear and tear will take a toll.

Another reason to consider adjustments on bows is because you are growing and every time you go through a growth spurt it affects your performance and your bow's measurements. Generally every time you grow another inch or two so you should take your bow in to get tuned.

REMEMBER!!!

- a. **NEVER** "DRY FIRE" your bow. If you do accidentally mis-nock or dry-fire, check the bow and arrow thoroughly for possible damage. Replace any nocks with cracks or arrows that are bent.
- b. Occasionally inspect your compound bow for wear or damage. If you hear any unusual noise or feel any unusual vibrations STOP shooting your compound or crossbow and check it completely for any damage. If you cannot pinpoint the problems do not shoot the bow, take it to a Pro Shop to have it checked out. The noise may become a problem that could be costly, like a cracked limb.
- c. **NEVER** ever allow your compound bow to be put into a center pulling bow press; this will cause twisting the bow riser (handle) will result in getting a new bow or riser. Also turn the poundage to lowest setting on the quad limb (split limb) bows, and use a press for parallel limbs only. Improper use of any bow press could twist your riser a little or very bad and even crack limbs.
- d. Remember to keep your bow away from any heat source that could damage it severely. Excessive heat, such as what could be experienced on a sunny day inside a closed vehicle, could cause limb failure. The extreme heat of over 100 degrees Fahrenheit also breaks down the new synthetic string and cable materials, allowing them to stretch. When shooting your compound or crossbow outside in the heat, the bow's synthetic cables and string can also stretch. When the string stretches from heat or old age, the poundage goes up. When any of the synthetic cables stretch the synchronization or timing can be affected. Prolonged storage in a damp location could also be damaging to any metal parts.



STRINGS - The simplest thing you can do to maintain your string is to wax it. Your strings and cables will break down faster than anything on your bow. Keeping them lubricated with string wax is important to their longevity. Ideally you can follow a rule, wax strings every 2nd or 3rd time you shoot. Things to look out for: When you see "hairs" start to stick up from the strands of the bowstring, like the string is getting furry, it's time to apply some wax. If you see individual strands sticking out, that's a damaged bowstring, and it has to be replaced.



Equipment Maintenance

Make sure you use a decent brand of wax that is soft. Applying wax to a bowstring is simple. Most bowstring wax comes in a stick, like deodorant. Just rub the stick up and down the string to apply wax, and then rub it into the string by running your thumb and forefinger up and down the string. Use enough pressure so that your fingers heat up. That will cause the string to melt between your fingers as you work it up and down the string.



Basically, you should be able to touch your string at any time and feel a slight tackiness to it. That's a well-waxed string. If it feels slick and dry, give it a shot of wax.

When you're done, there should be no visible chunks of wax.

When you're done, there should

Do not apply wax to any serving material. The wax can work its way under the serving material, causing it to slide and separate.

Be sure you don't over-wax your string. This can adversely affect performance.

There is also a lot of information out there on how often to change your strings and cables. Some say you must change them every year while others say it's not a big deal change them ever 3 or 4. It really all depends on the quality of the strings, how much you shoot and what kind of exposure they get. By exposure I mean do you leave it baking in the sun through a window most of the time or do you take it out in rain several times a year. If you shoot weekly or even daily you'll need to change them sooner. Over time they can break down and stretch and it can rob the bow of proper performance.

PROPER SERVING

Closely inspect all of the serving on your strings and cables. Serving is thread that's tied in over top of the string.

All bowstrings have serving in the nocking area. The ends of strings, where they attach to the cams or the limb tips usually are served. Also, most compound strings and cables have serving anywhere they touch a cam, roller guard or string stop.

You want the serving to sit in tight coils, neatly stacked one on top of the other, on top of your string. Any separation in the serving in the nocking area must be addressed ASAP. This can affect accuracy.



Equipment Maintenance

Slight separation of the serving coils in other places isn't a pressing concern, but it's only going to get worse, and it will have to be fixed at some time.

If the serving breaks, it must be fixed no matter where it is on the string or cable.

Your local archery pro shop can fix serving issues, or you can learn to do it yourself. Re-serving some area on compound bows, however, will require a bow press.

Be aware that serving thread comes in different thicknesses. Serving thickness is most critical in the nocking area, since you want to use whatever thread allows for proper nock fit.

AXLES OR CAMS

The axles only need to be lubricated infrequently. This means whenever you have your strings changed make sure your bow technician lubes it up and you're good to go. If you plan to hunt in the rain wipe it off as soon as you're done and you can even apply some string wax to hardware that may be prone to rusting prior to going out. The only other consideration is storage. While bows are durable if exposed to intense heat such as being left in the car on a hot summer day the limbs can delaminate and cause permanent damage.

Check your bow's 2-cam, one-cam or cam in a half system synchronization periodically and have it adjusted if needed. Synchronization is very important for you in shooting tight groups.

Synchronization is the relative position of one-cam to another on 2-cam bows as they rotate to load the limbs and store energy. Synchronization is necessary in order for the limbs to work together and be set up for optimum tune. Timing is defined as the position of the cam or cams relative to their ability to store energy and affect draw length. Bow timing determines the stored energy uniqueness of the bow and how the bow draws and feels. Timing also affects draw length and poundage, this also give better arrow flight. Timing is also called optimum cam location. Timing will help the nock travel as the bow is shot. Each manufacture has ways to adjust this.

At full draw on 2-cam bows, either cams or wheels should rotate and reach the let-off position at the same time. If one cam is not in the same position as the other, one of the 2 buss cables need to be adjusted. For proper arrow tuning, the cams or wheels should be matched for rotation and full draw.

Note: If the cams get too far out of synchronization or timing it will lead to premature bowstring failure.

Keep your axles well lubricated with very good quality oil. Never use WD-40 or any other sprays that may contain any cleaning agents. If your bow does have eccentrics (cams) with needle bearings, do not oil them. The oil liquid breaks down the grease that they are packed with and will cause wear or damage to the bearing and the axles. Manufacturers recommend using a good quality lubricant, Tri-Flow is a good one.

It is routine for your bow tech to check the cams and timing during your annual bow check up.



Equipment Maintenance

STRING STRETCH

Recurve archers will want to constantly measure their bow's brace height to check for string stretch. The brace height is the distance between the throat of the grip and the string. Over time, the brace height on a recurve can shrink if the string stretches – especially within the first few days after a new string is put on a bow.

In that case, unstring the bow and add twists to it until the brace height is where it needs to be. Twisting the string will increase the brace height.

On compound bows, archers need to check cam timing to determine if there's been any stretching of the cables. You want the cams on dual-cam bows to roll over perfectly in synch. If they are out of synch, accuracy will suffer. Twisting a cable will bring out-of-synch cams back together. Unless you know how to do this or have performed this type of tune up, please leave this to your bow tech.

If you have a single-cam bow, check with the manufacturer to find out how to determine proper cam position for your bow. The fix for cable stretch still will be to twist a cable.

Do not draw the bow past its designed draw length setting. The cable on the back side of the cam will be stressed and will break in time. Look at the serving on the cable and see if you have a big dent up about 6" from the cam. Some small dents are normal, but serving separation is not good. In time, the cable will be cut.

MAKING NEW OR REPAIRING OLD ARROWS

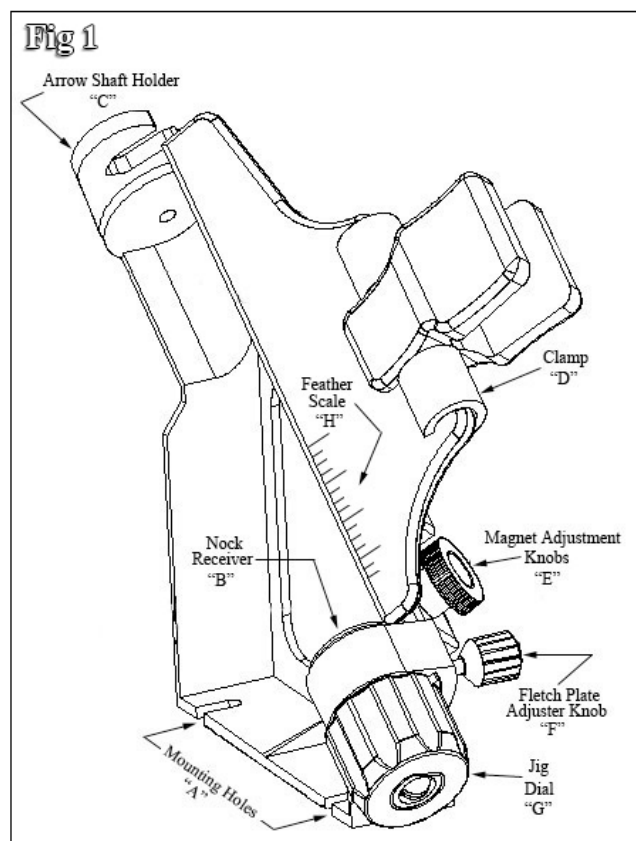
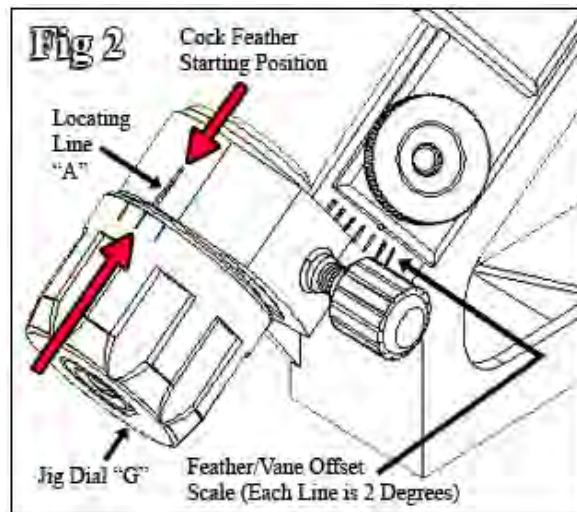
- ✿ Remove the old vanes or feathers, also broken nocks and points.
- ✿ Remove all of the old glue.
- ✿ Clean arrow with alcohol or acetone (Nail Polish Remover) test on a small area before you use it on your arrow it may remove the coloring.
- ✿ Do not touch the arrow with your hands where you are going to glue.
- ✿ Glue nock on with fletch-tite.
- ✿ Place arrow in fletching jig.
- ✿ Glue vanes or feathers on with fletch-tite or super glue.
- ✿ Place a little dab of glue on the end of each vane, facing the bow, to keep the vane from opening when it is shot in the grass.
- ✿ If using fletch-tite let the vanes/feathers dry 24 hours before using.
- ✿ A helpful tip is to hot glue points and inserts into or on the arrow.
- ✿ Take your time and do it right and your arrows will last a long time.

On pages below there are instructions on using the jigs when repairing arrows. You will have an opportunity to learn how to do this.



Fletching Jig & Instructions

1. The jig base should be mounted to a board or counter by using holes provided on bottom of the base. (*Fig 1 "A"*) note: #10 wood screws.
2. Arrow shafts should be cleaned before fletching, Read your fletching glue for proper cleaning instructions. This is a very important step, this will insure a good bond.
3. Insert nock into the desired position in the nock receiver (*Fig 1 "B"*). If you are **not** using adjustable nocks there are six small lines located on the jig dial (*Fig 2 "G"*), 3 longer lines and 3 shorter lines. Three of these lines are shown in (*Fig 2 "G"*). The plate you have installed in your jig will determine what lines you will be using for the cock feather alignment. Loosen the nock adjustment knob (*Fig 1 "F"*), rotate the jig dial (*Fig 1 "G"*) until the proper lines are visible (*Fig 2 "G"*). Then move the jig dial left or right until the middle line on the jig dial and the locating line on the jig base (*Fig 2 "A"*) are aligned (*Fig 2* red arrows). If you cannot get them to align properly, then rotate the dial to the next set of lines and repeat this process. After you have completed this, lock down the fletching plate adjustment knob (*Fig 1 "F"*). This step is not necessary for a 4 X 90 Fletching or adjustable nocks.
4. Lay the shaft of the arrow in the shaft holder (*Fig 1 "C"*). If you are using Graylings index shaft holder you will have to rotate the index shaft holder to the shaft size you are using.
5. **The nock adjustment knob (*Fig 1 "F"*) must be locked into position before any gluing is started.** Note: The adjustment knob (*Fig 1 "F"*) allows for a 7 degree offset each side of the cock feather starting position, this can be useful for lining up and repairing old arrows.
6. Insert vane or feather into the clamp (*Fig 1 "D"*). Use the marks on the clamp (*Fig 1 "H"*) for a reference to ensure feather position (1/2" to 5/8"), so all feathers are the same distance from the nock. Make sure your feather/vane is seated to the clamp properly.
7. Loosen the magnet adjustment knobs (*Fig 1 "E"*), place the clamp on the magnet. Move the magnet until you have the desired position of your fletch on the arrow shaft. The feather/vane should be touching the shaft from one end to the other.
8. Lock the magnet adjustment knobs (*Fig 1 "E"*) into place. Your jig is now set.
9. Remove the clamp from the magnet.
10. Perform another dry run to ensure the feather/vane is in the position you want. Do this by placing the clamp back on the magnet and push the clamp down on the shaft.
11. After checking the position of the shaft and feather/vane, run a thin line of your fletching glue along the entire base of the vane. Replace the clamp on the magnet and press into position.
12. Allow the glue to dry the recommended time.
13. Release the feather/vane from the clamp, and remove the clamp from the magnet.
14. Rotate the dial (*Fig 1 "G"*) to the next click.
15. Insert vane of feather into the clamp, using the same marks (*Fig 1 "H"*) on the clamp you used the first time to position this feather/vane.
16. Repeat process 11 through 15 until your arrow is complete.



You can find these instructions on: https://www.graylingoutdoorproducts.com/support_fj_ins.html

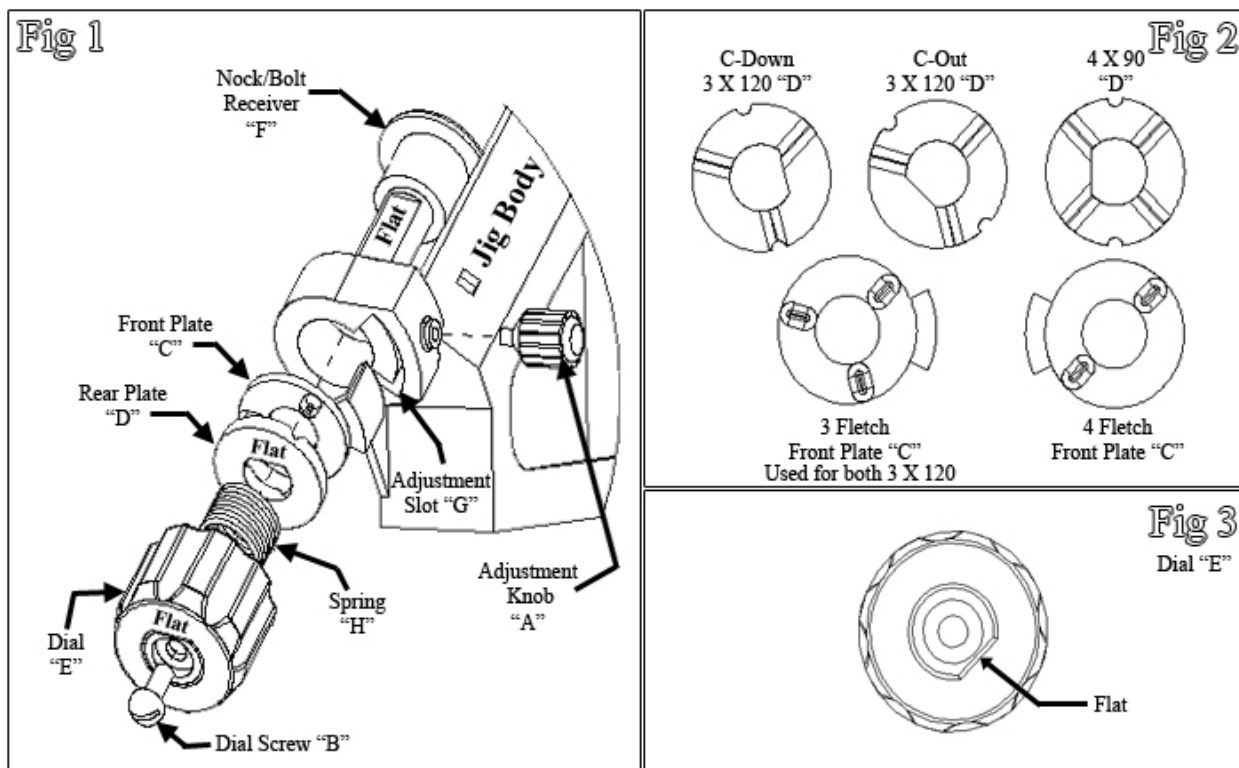


Installing Graylings Crossbow bolt receiver

Tools Needed: Phillips head screw driver

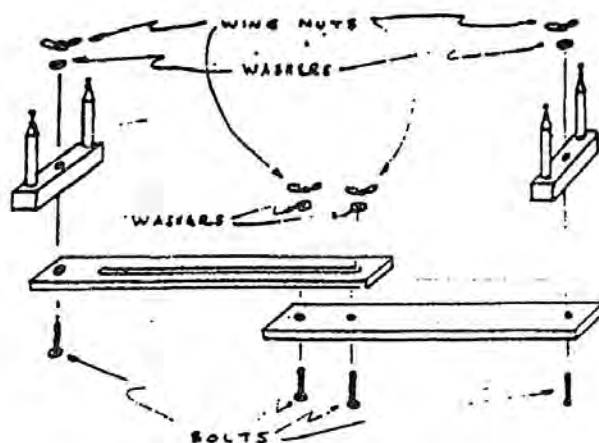


1. Loosen adjuster knob (*Fig 1 "A"*).
2. Remove dial screw (*Fig 1 "B"*) completely with a Phillips head screw driver.
3. Remove dial (*Fig 1 "E"*), spring (*Fig 1 "H"*), rear fletch plate (*Fig 1 "D"*) and front fletch plate (*Fig 1 "C"*). Slide the nock receiver (*Fig 1 "F"*) out from the front.
4. Slide your new crossbow bolt receiver (*Fig 1 "F"*) thru the jig body nock hole.
5. Hold the jig body so the nock receiver (*Fig 1 "F"*) is facing down, holding the nock receiver in with your thumb.
6. Place the front plate (*Fig 1 "C"*) over the back end of the receiver and into the adjustment slot shown in (*Fig 1 "G"*).
7. Place the rear fletch plate (*Fig 1 "D"*) over the back of the receiver (*Fig 1 "F"*) lining up the flats.
8. Replace the spring (*Fig 1 "H"*) on the back end of the receiver (*Fig 1 "F"*).
9. Line the flat of the dial (*Fig 3*) with the flat of the receiver (*Fig 1 "F"*) turning the dial slightly in both directions while applying slight downward pressure till the whole assembly drops together.
10. While holding the whole assembly together with your thumb and finger replace and tighten the dial screw (*Fig 1 "B"*).
11. Tighten the adjuster knob (*Fig 1 "A"*) and you are ready to begin fletching again.



This information can be found on: https://www.graylingoutdoorproducts.com/support_fj_cross.html

BOW STRING JIG



ASSEMBLY FOR LONGER STRINGS



O.H. Mullen Archery, Inc.

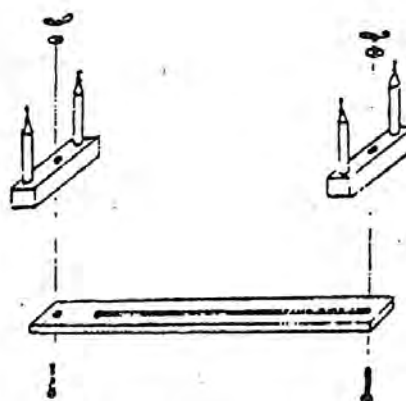
MANUFACTURER OF MARCO NOCKS, VANES, ACCESS

R.R. # 2, OAKWOOD, OH 45873

INFO: 419-594-3313

OHIO ORDERS: 1-800-248-6625

OUTSIDE OH: 1-800-258-6625



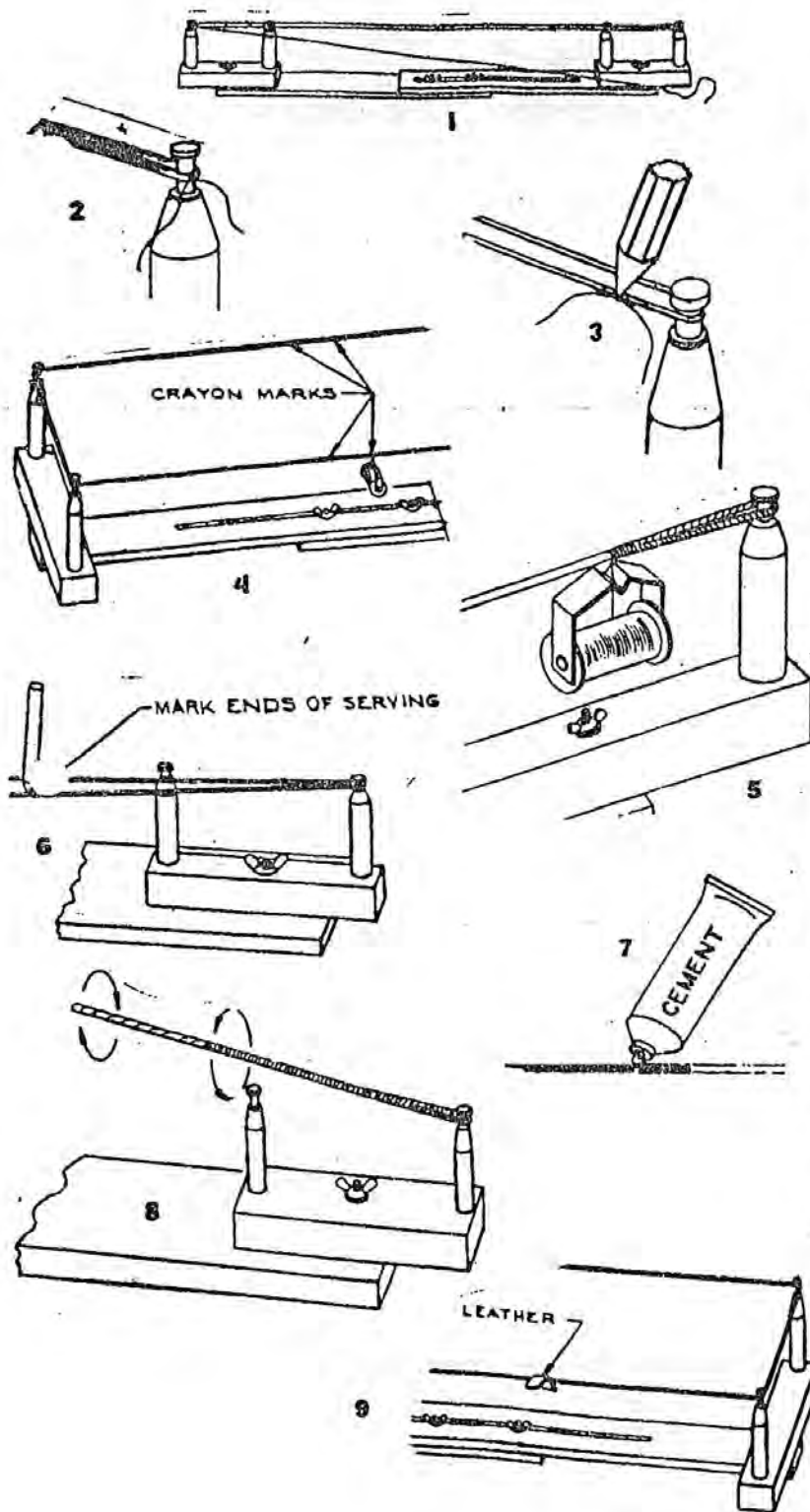
ASSEMBLY FOR SHORT STRINGS

Here is a jig designed for professional and amateur alike. It is adjustable for all lengths of bow strings and has pivoting end posts.

These plans are a bit hard to read but are simpler than some of the others we have found. Below is one other location where you can find instructions on making a Bow String Jig and making a bowstring:
<http://holstebrobeskytteforening.dk/uploads/pdf/Buegrej/STRING%20MAKING.pdf>



HOW TO MAKE A BOWSTRING



STEP 1: Turn both End Posts in line with Base and set Jig for desired bowstring length. Slide Dacron Thread under End Post at pivot, leaving about 18" hanging over. Wrap desired number of strands of thread around posts, being sure thread is fitted into metal post end. Wrap snug, but not tight. (1) After strands of thread are wrapped, tie ends together at End Post using a square knot. (2)

STEP 2: Rotate bowstring around End Post until knot is about 1-1/4" from Post. Mark with crayon on both sides of bowstring at knot. Repeat the marking at other end. This determines loop size and may be varied as you prefer. (3)

STEP 3: Rotate bowstring around End Posts until crayon marks are about in center of Jig. Pivot End Posts opening up bowstring. (4) Apply Bowstring Wax between marks. Serve bowstring between marks using your favorite method, tool, and material.

STEP 4: Pivot End Posts in line with Base. Rotate bowstring around End Posts until served loop sections are in position for forming loops. (5) Serve the shank of loop about 5" down bowstring, overlapping the original loop serving about 1/8". Complete both loops.

STEP 5: Loosen Jig Adjustment Nuts and remove one loop of bowstring. Place loop over End Post on top of other loop. Stretch bowstring and mark location of center serving on both halves of bowstring. (6) The center serving should be about 8". Return loop to other End Post, tighten Jig and serve center serving.

STEP 6: Apply a dab of Duro, Everfast, or other flexible cement to end of each serving and overlapped junction of loops. Rub in cement with finger. (7)

STEP 7: Wax entire length of bowstring. Remove one loop and twist bowstring about 12 full turns in clockwise direction for type #V-207 Dacron and counterclockwise for #1100/2. (8)

STEP 8: Using a folded piece of hard leather, burnish entire length of bowstring to melt in wax and make string round and smooth. (9) Put bowstring on bow and adjust length by twisting. Do not twist more than 12 additional turns, or until string begins to knot. If bowstring does not fit correctly, make a new one, adjusting the Jig according to the error.



Competition Shooting

In 4-H anyone who is a member can participate in the competitions set up by the state or counties, it is just a matter of signing up and paying any fees being charged. If you have a desire to compete please let us know and we will walk you through the process. Happy Shooting! Attached with this packet we have included a calendar and a dates and locations list with scheduled tournaments for the current year for Orange County, surrounding counties (if advertised) and state matches.

For competitions each participant is placed into divisions. These divisions are dictated by Florida 4-H Shooting sports and should be reviewed before registering for each competition just in case anything has changed from one competition to another.

Florida 4-H Archery Division Changes: Effective: 2016-2017 year

Archers will be divided in the following divisions:

- Division 1 – Junior Sighted Recurve
- Division 2 – Junior Sighted Compound
- Division 3 – Junior Novice (all unsighted recurve bows and universal cam unsighted compound bows)
Note: All fixed draw length compound are considered Division 2.
- Division 4 – Intermediate Sighted Recurve
- Division 5 – Intermediate Sighted Compound
- Division 6 – Intermediate Novice (all unsighted recurve bows and universal cam unsighted compound bows)
Note: All fixed draw length compound are considered Division 5.
- Division 7 – Senior Recurve – Includes Sighted and Unsighted
- Division 8 – Senior Compound – Includes Sighted and Unsighted

This information can be found: http://florida4h.org/events/files/shooting_sports/ArcheryUpdates.pdf

The website also includes upcoming events: <http://florida4h.org/programsandevents/shootingsports/>



Life Skills		Short Term Goal, Long Term Goal, Future plans
Head	Thinking	Which division would you fall into this year?
Hand	Working	What division do you want to be a part of next year?

Date **Applied** _____ Approved by _____



Competition Shooting

COMPETITION ROUNDS EXAMPLES

Freeman Round (NFAA)

This round consists of 60 arrows shot as three games at distances of 9, 13.5 and 18 meters (10, 15 and 20 yards). Each game includes four ends of five arrows.

- First Game – Three ends at 9 meters (10 yards); one end at 13.5 meters (15 yards)
- Second Game – Three ends at 13.5 meters (15 yards); one end at 18 meters (20 yards)
- Third Game – Four ends at 18 meters (20 yards)

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

Indoor Round (NFAA)

This consists of 60 arrows shot as three games at a distance of 18 meters (20 yards). Each game has four ends of five arrows per end.

900 Round (NAA)

This is an outdoor target round. The course is set up in an open area. A 122-centimeter (48-inch) five-color target with 10-ring scoring is used.

Scoring, from center out, is 10-9-8-7-6-5-4-3-2-1. The distances and number of arrows are:

- 30 arrows at 60 meters
- 30 arrows at 50 meters
- 30 arrows at 40 meters

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

Junior 900 Round (NAA)

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

- 30 arrows at 50 meters
- 30 arrows at 40 meters
- 30 arrows at 30 meters

Easton Round (NAA)

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

- 20 arrows at 60 meters
- 20 arrows at 50 meters
- 20 arrows at 40 meters

Junior Easton Round (NAA)

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

- 20 arrows at 50 meters
- 20 arrows at 40 meters
- 20 arrows at 30 meters

Official 4-H Rules for competitions can be found on:

http://florida4h.org/events/files/shooting_sports/state_ss_rules_guidelines.pdf



Bow Hunting

In contrast to a rifle hunter, who may shoot effectively from ranges in excess of 200 yards (180 m); archers usually restrict shots from 2.3 yards (2.1 m) to 42 yards (38 m). The distance depends upon individual ability, the target animal, the bow strength, terrain, arrow and weather. The bow hunter may walk along the ground slowly, looking for game and stalking it carefully in the final approach. This type of slow, methodical stalking, is called "still hunting." Hunters often wear camouflage clothing and walk upwind (with the wind in their face) so that game ahead of them cannot smell them.

In "stand hunting," the hunter waits for game to come to him, usually near food, water, or known trails. Brush and other natural materials may be placed for cover, or a "ground blind" that looks like a camouflage tent may be used. They usually "pop" up and can be set up from folded in a few minutes. The hunter may wait on a wooden or metal stand elevated in a tree, from three to six meters.

Bowhunting for fish is called bowfishing. Bowfishing equipment usually adds a line attached to a spool or a reel as well as a specially designed, heavier arrow. Most bow-fishers do not use sights, but if they do have sights they are different from standard ones to allow for refraction.

Legal and cultural considerations

Bowhunting often has different seasons and restrictions from firearm hunting, and they differ significantly between areas. Legal and cultural approaches specific to the area must be taken into consideration by the hunter.

In the USA and Canada, as with other styles of hunting, bowhunting is regulated by individual provinces and states. Regulations often address issues such as which area to hunt in, what time of year, (season) and which sex and species of game may be taken. In many cases, a special archery season is set aside, to minimize interference from rifle hunters. While bowhunting can run into rifle hunting seasons, hunter orange is typically required to be worn during the cross over seasons. In addition, in an effort to maximize game recovery and shot lethality, there are often technical regulations, such as a minimum draw weight, minimum width of head, and lack of barbs. In general most bow hunting for big game begins in late August or early September in northern states or Canadian Provinces, and slightly later in southern states.

Specific Draw weights needed for hunting:

1. If you want to use the recurve to hunt for the most popular game (deer, elk, turkey), you need 40 lbs. draw weight or more (preferably 45)
2. If you want to hunt for the largest game (grizzly bear, ox, cape buffalo), you'll need 55 lbs. or more
3. If you want to use the recurve for target shooting, any draw weight will do – even 25 lbs.
4. If you want a recurve for both hunting and target practice, go for 40 lbs. or more.

You will adapt to higher draw weights very quickly; what may seem somewhat difficult one day, will become much easier after shooting a few hundred arrows. Stay patient and don't push yourself – your muscles **will** adapt rapidly.

Bow Hunter's Creed

I will:

- ✿ Keep a clean and safe camp.
- ✿ Put out my campfire.
- ✿ Be safe and cautious hunter.
- ✿ Only shoot a game within accurate range.
- ✿ Help the novice become a better hunter and sportsman.
- ✿ Cooperate with game and forest service officials.
- ✿ Abide by and help enforce hunting regulations.
- ✿ Use good hunting equipment and keep my broadheads razor-sharp.



Glossary of Archery Terms

Aim: Any method used to point the arrow in the direction you want it to go. When using sights, to superimpose the sighting device over the spot you wish to hit with your arrow.

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

Anchor Point: Places on the Archer's face, chin or cheek to which the archer habitually draws the bowstring.

Arm Guard: A piece of stiff material, usually leather, used to protect the bow arm from the slap of the bowstring or broken arrow upon release. It is worn on the inside of the forearm of the bow arm.

Arrow: A projectile shot from a bow.

Arrow Head: The point or the tip of the arrow.

Arrow Plate: A piece of material that is glued to the side of the bow at the point where the arrow contacts it. It provides protection for the bow from the friction of the arrow.

Arrow Rest: A small protrusion on the bow at the point where the arrow will rest during the draw.

Back: The side of the bow away from the archer.

Backed Bow: A bow with a strip of other material glued to its back to give it greater strength or cast.

Barbed Arrow: An arrow with strip barbs designed for hunting and fishing so it will not come out.

Barbs: The sharp points of an arrowhead that project backwards.

Bare Bow: A bow without a bow sight.

Barrelled Arrow: An arrow that is larger in the middle than at the ends.

Belly or Face: The side of the bow toward the archer.

Belt Quiver: An arrow container that is worn on the archer's belt.

Blunt Tip: An arrow point usually made of rubber, often used on small game or other archery activities.

Bow: A device made of a piece of flexible material with a string connecting the two ends, used to propel an arrow.

Bow Arm or Bow Hand: The hand and arm that holds the bow.

Bow Reel: A reel attached to the bow for bowfishing.

Bow Sight: A mechanical device placed on the bow or string which the archer uses for aiming at a target.

Bow String: String of the bow, usually made of Dacron.

Boyer: A maker of bows.

Bow Square: A T-shaped device used to measure brace height and for placing nock locators.

Bow String: A device used to string a bow.

Brace: To string a bow, to place the loops of the bowstring in the nocks of the bow.

Brace Height: The distance from the pivot to the string when a bow is strung. (Also called string height, once called the fistmele.)

Broad Head: A very sharp arrow point, usually with two or more cutting edges, used for hunting.

Bull's Eye: The center of the target.

Butt or Mat: A backstop usually made of straw, cedar tow, or sod on which the target is placed.

Cant: To tilt the bow left or right while at full draw.

Cast: The ability of the bow to propel an arrow a given distance

Center Serving: The material in the center of the bow string where the arrow is nocked protects the string from wear.

Clicker: A small strip of metal, mounted on the sight window in front of the arrow rest that gives a precise indication of when full draw is attained by snapping off the point of the arrow with an audible click.

Clout: A white object such as a cloth placed on a stake as a mark for long range shooting.



Glossary of Archery Terms

Cock Feather: The feather that is at right angles to the bow during the draw; usually the odd colored feather also called the index feather.

Composite Bow: A bow made of more than one material.

Compound Bow: A hand held, hand drawn bow that uses a pair of cables and wheels to store more energy.

Creep: To allow the arrow to move slowly forward before release.

Crest: The colored bands around the shaft of the arrow which aid in its identifications.

Crossbow: A bow fixed on a stock that has a groove or barrel to direct the arrow, a notch or catch to hold the bow string, and a trigger to release the string. Illegal for hunting during bow season.

Dominant Eye: The eye with which one naturally aims.

Draw: To pull the bowstring back. Also the distance the bowstring is pulled back

Draw Length: at full draw, the distance from the knocking point to the side of the farthest from the archer is the “traditional draw length.”

Draw Weight: The weight, measured in pounds, used to bring the bow to full draw. Also the weight on the bow, using 28 inches to front of the bow as the standard draw length.

Drift: Natural deflection of the arrow from its normal path due to outside factors such as wind.

End: A set number of arrows that are shot before going to the target to score and retrieve them.

End Loop: The part of the string fitting over the bow nock.

Face or Belly: The side of the bow closest to the bowstring.

Field Archery: Shootings arrows at targets at varying distances over different types of terrain, usually in woods a course similar to golf courses. Targets may be bull’s eyes or animal types.

Field Arrow: A heavy duty arrow adaptable for hunting.

Finger Tab: A flat piece of smooth material which protects the three fingers of the drawing hand.

Finger Sling: A small strap that attaches to the dumb and index finger of the bow hand.

Fistmele: The distance between bowstring and bow handle when strung, but not drawn.

Fletching, Fletch: The feathers, plastic vanes, or other devices attached to the arrow shaft which stabilize the flight of the arrow. Also, to attach these devices to the arrow.

Flight Bow: A strong bow used to shoot a great distance.

Flight Shot: A shot for distance.

Freestyle: Using a bow sight, a tournament classification allowing the use of a bow sight.

Flu-Flu: An arrow with large untrimmed feathers which restrict the distance it will travel; used for shooting aerial targets.

Follow Through: Maintaining the motion of the upper body muscles after releasing the string.

Full Draw: The positions of the archer when the bowstring has been drawn to the archer point.

Grip: The portion of the bow that is held by the bow hand.

Ground Quiver: A device that is stuck into the ground or sits on the ground to hold arrows or a bow.

Group: To shoot arrows in a pattern. The pattern of arrows in a target.

Handle: The rigid center portion of the bow which is held when shooting.

Head: Point or tip of the arrow.

Holding: Keeping an arrow at full draw while aiming.



Glossary of Archery Terms

Index Feather: The feather that is at right angles to the bow during the draw. The odd colored feather is also called the “cock feather.”

Instinctive Shooting: Shooting without a sight, aiming with both eyes on the target, used for quick shooting.

Jointed Bow: A bow whose limbs are joined at the handle, it may be separated folded for carrying and storing.

Judo Point: An arrow point with springy wires attached to it to limit the depth the arrow can penetrate the ground or target.

Kick: A bow is said to “kick” when a jar felt after a shot.

Kisser Button: An object on the string of the bow. It is used by sight shooters to establish a better anchor point. The object is touched with lips when holding.

Laminated Bow: A bow made of several layers of material glued together, usually two layers of fiberglass and a hardwood core.

Let Down: Returning from full draw to the undrawn position with control and not releasing the string.

Let Off: When drawing a compound bow, the point just after the maximum draw weight, when a “bump” is felt the Draw weight decreases to a fraction of the maximum.

Limbs: Upper and lower part of the bow that bends when the string is drawn back. The part of the bow where the energy is stored.

Long Bow: A style of bow that is straight when unstrung. Known as a straight or stick bow.

Loose: To release or shoot a drawn arrow.

Matt (Butt): The circular disc of grass or plastic to which the target face is attached.

N.A.A.: National Archer Association.

N.F.A.A.: National Field Archery Association.

Nock: Grooves at the ends of the bow which hold the bow string. The grooves at the end of the arrow into which the bow string fit. To place the arrow in position to shoot with the bowstring in the nock of the arrow.

Nock Locator: The mark or device that indicates where the nock is to be placed on the string.

Notch: The groove or ridge in the tips of the bow limbs that holds the bowstring when the bow is strung.

Over Bowed: Using a bow beyond one’s strength.

Overdrawn: Drawn too far, either the bow or the arrow.

Petticoat: The portion of the target outside of the scoring area.

Pile: The head, tip or point of an arrow.

Pivot point: The point on the face side of the bow handle which is the deepest part of the bow grip, approximately the center of the riser.

Point Blank: Aim taken at a distance where the point of the arrow is in line with the archer’s eye and the center of the target.

Point of Aim or Aiming point: A small object placed on the ground between the bowman and the target. When the tip of the drawn arrow is in line with the bowman’s eye and the aiming point, it should be on target. The aiming point is moved until the arrow hits the target. Used in practice to develop uniform position and release, and for lawn archery. It could also be any object above or below the target on which the bowman sights.



Glossary of Archery Terms

Quartering Wind: A wind blowing obliquely across the target.

Quiver: A holder or sheath for carrying arrows.

Range: A place set up for shooting.

Recurve Bow: A bow with limbs that bend away from the archer when the bow is held in the shooting position, 10 to 12 inches from the end.

Reflexed Bow: A bow which when unstrung bends in the opposite way to its curve when strung.

Release: The act of relaxing the fingers that are holding the bowstring at full draw and shoot the arrow.

Riser: The middle section of the bow that divided the upper and lower limbs.

Round: A prescribed number of arrows, end, and games, shot as prescribed distances.

Roving: Shooting random objects at unknown distances.

Self-Bow: A bow made of a single piece of wood, not laminated or backed.

Serving: The wrapping of material around the loops and center of the bowstring to protect it from wear.

Shooting Glove: A special three fingered glove that can be worn to protect the tips of the fingers that draw the bowstring.

Shooting Line: The common line straddled by all archers when shooting.

Sight: To aim, a device placed on a bow to enable the archer to aim directly at the target.

Sight Window: The opening provided by an offset section of the bow to allow the arrow point straight ahead.

Spine: The stiffness or amount an arrow bends, determined by hinging a 2 pound weight from the center of the arrow and measuring the bend. Arrows should be matched in stiffness to the weight or cast of the bow.

Stabilizer: A rod attached to the handle of the bow riser. Usually has a weight of the rod. The stabilizer absorbs the vibration of the bow when the string is released.

String Hand: The hand that draws the bowstring.

Tackle: An inclusive term for archery equipment.

Take Down Bow: A type of bow that can be taken apart for storage or transporting.

Target Archery: Shooting arrows at fixed distances at target, usually in open areas on level ground or indoors.

Target Face: The front cover of a target, painted with regulation rings or designs.

Tips: The very ends of the limbs of a bow.

Torque: An undesirable twisting of the bow by bow hand or of the string by the string by the string hand.

Toxophilite: One who loves, studies, and practices archery. One who studies the history and archaeology of archery.

Trajectory: The path of an arrow flight.

Tune: To adjust the variables in the bow and arrow system to achieve the best arrow flight and arrow groups'.

Vane: Any fletching made of a material other than feathers, usually plastic.

Weight: The force (strength) required to draw the bow the length of the arrow, usually 28 inches.

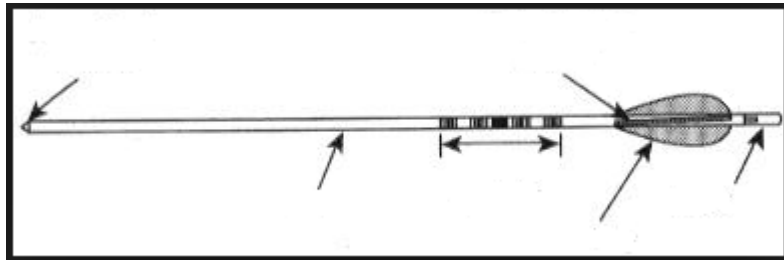
Windage: 1. The left-right adjustment of the bow sight,
2. The influence of the wind on an arrow in flight.
3. The extent of such deflection. 4. Same as drift.



Improvement of Skills

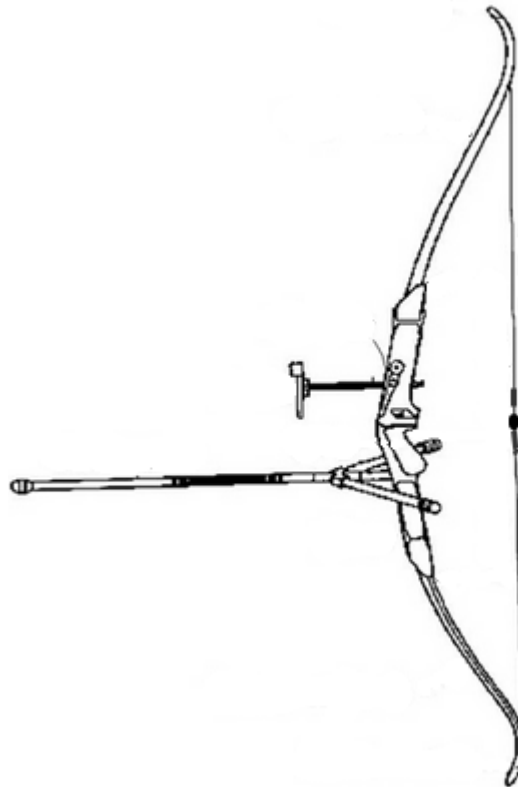
4-H NOVICE BOWMAN

1. Review diagram and label the following: Crest, fletching, cock feather, point, shaft, and nock.



Date Passed _____ Approve by _____

2. Label the diagram with the following parts: Tip, back, face, arrow rest, bowstring, serving and nock locator.



Date Passed _____ Approved by _____



Improvement of Skills

3. Define, describe, and/or explain the purpose or use of these archery terms:

A. Arm Guard _____

B. Cock Feather _____

C. Crest _____

D. Draw _____

E. Arrow Nock _____

F. String Nock _____

G. Over Bowed _____

H. Under Bowed _____

I. Petticoat _____

J. Quiver _____

Date Completed _____ Approved by _____

4. Demonstrate how to string a bow.

Date Completed _____ Approved by _____

5. Demonstrate how to nock, draw, and release an arrow safely.

Date Completed _____ Approved by _____

6. Shoot 30 arrows at 10 meters and record your score. Use a 60-cm 10 ring target. Score at least 130 Bare Bow or 150 Free Style.

Date Completed _____ Approved by _____

7. Attended 2/3 Club Meetings.

Date Completed _____ Approved by _____



Improvement of Skills

8. Complete at least one of the following electives:

Electives

Experience – Project Leadership	Date Experienced	Approved By
1. Lead the “Pledge of Allegiance” at a 4-H meeting.	_____	_____
2. Lead the “4-H pledge” at a 4-H meeting.	_____	_____
3. Preside at a meeting for your 4-H club.	_____	_____
4. Give a presentation before the group.	_____	_____
5. Learn how to measure yards/meters for a practice or a tournament	_____	_____
6. Prepare a game for your 4-H Club	_____	_____
7. Serve as a teen leader.	_____	_____
8. Learn to make your own finger or wrist sling	_____	_____
9. Learn to fletch arrows	_____	_____
10. Learn to make a de-stringer	_____	_____
11. Learn how to change or add a nock to an arrow	_____	_____
12. Teach archery at a 4-H or other youth program	_____	_____
14. Learn how to properly wax bows	_____	_____
15. Learn to make your own quiver	_____	_____
16. Design your electives(s), the possibilities are endless:		



Improvement of Skills

9. Complete at least one of the following electives:

Electives

Experience - Project Citizenship

Date

Approved
By

1. Read a story, article, or book on archery and report to your club.
(This elective may be repeated by reading different articles.)

2. Organize and lead an archery game.

3. Make a set of six arrows. You may purchase parts.
(They should be suitable for your bow and draw.)

4. Help to do a community service project with your 4-H club.

5. Become the club's historian and offer to supply fellow members
with copies of pictures or record keeping during club events

6. Offer to help instructors or parents during 4-H events.

7. Obtain donations for your club's tournament (prizes or supplies)

8. Participate in fundraisers for your 4-H club.

9. Make an archery target, you can bring it to practice.

10. Set up an archery range at your home for yourself.

11. Create a fundraiser for your 4-H Club.

12. Donate your time and energy to working a 4-H event.

13. Participate in an archery match or tournament.

14. Earn the privilege of representing your county at a State 4-H
Archery tournament.

15. Design your own archery elective(s):

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

Date _____ Approved by _____



300 Score Card at 9 Meters

For: 4-H Junior Bowman (Jr.), 4-H Bowman (Intr.) & 4-H Archer (Sr.)

Name _____

Date ____ / ____ / ____

Division _____

1

	1	2	3	4	5	Hits	End Score	Running Score
1								
2								
3								
4								
5								
							TOTAL	

2

	1	2	3	4	5	I HITS	End Score	Running Score
1								
2								
3								
4								
5								

TOTAL	
TOTAL of 1&2	

Approved _____



600 Score Sheet

For 4-H Bowman (Int.) & 4-H Archer (Sr.) only

Name _____

Date ____ / ____ / ____

Division _____

	1	2	3	4	5	Hits	
1							
2							
3							
4							
5							
6							
						TOTAL 1-6	

	1	2	3	4	5	Hits	
7							
8							
9							
10							
11							
12							
						TOTAL 1-6	
						Running Total	TOTAL 1-12

900 Score Sheet

For Archer (Sr.) only

	1	2	3	4	5	Hits	
13							
14							
15							
16							
17							
18							
						TOTAL 1-6	
						Running Total	TOTAL 1-18

Approved _____



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