

Bow & Arrow, Archery Set for Scouts

(Busòg at Palasô, Panàng pang Iskaut)

Illustrated “How to Build” Guide #1

A Take Down and Portable Archery Set
Designed & Developed for the
Boy Scouts of the Philippines

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Edited for E-Book publication by **Bong Saculles**

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ACKNOWLEDGMENTS

In May 2011, during a Committee National Scout Organization (NSO) Visit (CNV), I had the opportunity to travel to the exotic and beautiful country of Bhutan.

Archery is the Bhutanese National Sport and I discovered that their traditional bow is made from Bamboo, while their Arrows are crafted from a type of Reed Grass. With that as the seed of an idea, I designed and developed this "Archery Set for Scouts" during the 15th National Jamboree at Mt. Makiling in June of 2011, with bamboo materials from Romy Apuli, the carving skills of Salvador Llenas Jr. a Makiling Scout Camp Staff, assigned to me by the Camp Administrator, Eusebio Mole and suggestions from Willy Pabuaya.

This Archery set can be made at a minimal cost because it is constructed from indigenous and recycled materials that are found all over the Philippines. The tools required are simply a Machete "Bolo" and a Swiss Knife.

I hope that illustrated set of instructions will guide you in making a functioning "Panàng Pang Iskaut" ("Archery Set for Scouts") that can now be used by scouts to earn an Archery Merit Badge.

Please see the BSP Archery MB requirements at the end of this guide.

Enjoy this scout project and work your way to earning the Pioneering and Survival Merit Badges also!

As a note, National Executive Board (NEB) member Rene Aquino is a Pilipino Teacher and he said that the proper Pilipino translation for Bow and Arrow is Busòg at Palasô the combination of both words is equivalent to Panà! So the word Archery is properly translated as Panàan, Archer is Mamamanà, etc.

Thank you to all those who helped me develop this ARCHERY SET FOR SCOUTS. Special thanks to my daughter, Camille, who did the main editing of this guidebook.

(Signed) Jose Eduardo C Delgado

BSP Program Committee Chairman & NEB Member

FOREWORD

(by the Secretary General of the Boy Scouts of the Philippines)

Dear Scouts,

It is with great excitement that we introduce this "How to build a Bow and Arrow, Archery Set for Scouts" instructional book.

It is envisioned to be a great pioneering project that scouts and their units can accomplish using just simple tools and materials found all over the country.

It is hoped that among our almost 2 million members some of them may discover the joys, skills and challenges in the sport of Archery.

I would like to commend the author, Mr. Jose Eduardo Delgado, and the Program Committee for having come out with this laudable project.

Scouts, take out your tools and go make your own "Busog at Palaso, Panang pang Iskaut," go learn the sport of Archery and have fun!

(Signed) J R Pangilinan

Secretary General

Boy Scouts of the Philippines

INTRODUCTION

This is a simple and illustrated, HOW-TO guide for an economical and environmentally friendly, Archery Set.

The materials used are bamboo, reed grass, and recycled man-made materials found easily around the world *most prominently in third-world countries.*

This guide will allow scouts in all economic situations to learn gadget building skills and archery, hence reinforcing the idea that "*Scouts Build a Better World.*"

Hopefully, experienced archers will find this guide entertaining and challenging, allowing them to expand their creativity and handicraft skills.

The author envisions a series of guides that serve to further enhance the development of scouts' archery skills, while teaching them rudimentary survival tactics that they can both enjoy and benefit from.

INSTRUCTIONS to build a *Busò at Palasô pang Iskaut*



A. Required Parts

- (1) A sharp **machete** “Bolo”
- (2) A **Swiss Knife** that has a wood saw, scissors, awl (drill), small ruler & pliers.
- (3) **Marker Pen** or Pencil
- (4) Find or buy the **STRAIGHTEST, FATTEST** and **DRIEST Bamboo Base Pole** (nearest the root) that is more than 4' (120cm) in length and at least 5" (13cm) in diameter.
- (5) Find or buy the **STRAIGHTEST** and **DRIEST “Talahib”** or **Reed type grass stalks** that are more than 4' (120cm) in length with a minimum of 5/16" (8mm) in diameter.
- (6) A used **Rice/Palay Sack** or other light clothing material.
- (7) 3 meters length of a **small diameter thread** (Sinulid) 1/32" (<1mm) in diameter.
- (8) 3 meters length medium weight 1/8" (3mm) diameter **3-part wound string**.
- (9) **Candle Wax** drippings or better yet some beeswax.
- (10) 2 sets of **#10 bolt and nut** that is at least 1 1/2" (4cm) in length with flat washers.
- (11) A used **rubber inner tube** at least 18" (45cm) long and several inches wide.
- (12) Scrap **Rubber Slipper sheets** for Arrow Heads.
- (13) A tube of **superglue**, found in most neighborhood convenience stores.
- (14) Sandpaper **#60** or **#80**.

B. Optional Tools

- (1) A small Hand Held **carpenter's plane** (katam).
- (2) A **crosscut wood saw** best if it's around 1/8" (3mm) thick.
- (3) A hand/electric drill with a **drill-bit around 1/4" (6mm) in size**.
- (4) **Open wrench #10** to fit the bolt/screw you will use.
- (5) **Screwdriver** to fit the screw you will use if it is not a hexagonal bolt head.
- (6) A **round file** of about 1/4" (6mm) in Diameter.
- (7) A **straight edge** to draw lines on the bamboo. (You can freehand this too)
- (8) A small amount of **epoxy clay** or any non-sag moldable epoxy.



C. Bow (*Busòg*) Construction Steps

(1) Neatly cut the Bamboo Base Pole **just below the lowest base chamber**. (The base chamber is the sectional part "bukò" nearest the root of the bamboo stalk.) Smoothen the outside skin as best as you can with your machete. **Do not remove the bamboo skin**, as this is an integral part of the bow arm strength. Use the sand paper to smoothen the outside skin.

Here's a photo of a smoothed Bamboo Base Pole about 4 feet (1.2 meters) long.

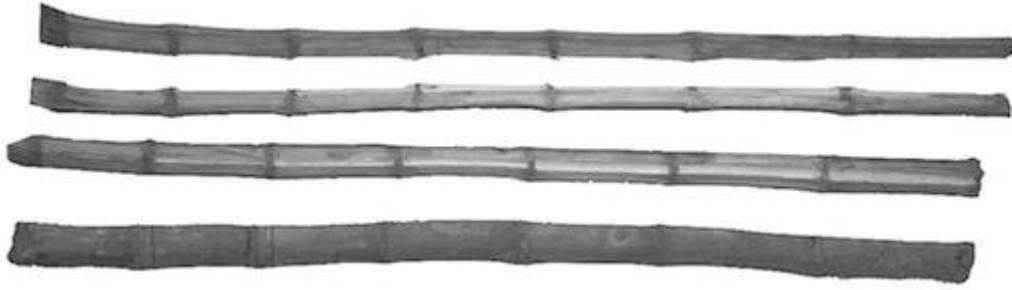


(2) Using a marker pen or pencil, draw a line **ALL AROUND** the lowest base chamber (see the arrow in the photo) "bukó" of the pole. This is the area reserved for the bow handle.

Here's how to mark the base of your Bamboo Pole.



(3) Split the pole, **lengthwise** into **4 equal** lengths and you will now have 4 fat strips.



(4) Split each fat strip into **2 thinner strips** making a matched bow arm pair.



(5) Reduce the total thickness of the bow arms to about 5/8" (15mm) from **END to END** with your machete.

Note: You should **ONLY** shave the **INNER PART** of the Bamboo, **DO NOT** remove the **OUTER SKIN**.

(6) Measure the length of each pair of bow arms from the base section to the upper section that lies between **36" to 45"** (90cm to 115cm) from the bottom and cut the Bow Arms just above the upper section.

Note: **ALL Bow Arms** must start and end at a section "**bukò**" (joint) and must not be shorter than **3'** (90cm) or longer than **4'** (122cm) from end to end.

(7) On the outer skin of each bow arm, draw with a marker pen, two **PARALLEL LINES** about 1" to 1 1/4" (28-32mm) apart, from end to end on every Bow Arm as shown in the photo below.

Here is a photo of thin strips with drawn lines.



(8) Using a Machete (Bolo) slice the Bow Arms until you achieve the desired width as you have drawn.

(9) Draw a tapered shape on the bow arm from around midpoint to about ½” (12mm) wide at the Bow Tip. Taper the bow arms to a pointy shape and double check that both Matching Bow Arms are somewhat identical in shape to each other as in this photo of a pair of fully tapered bow arms.



(10) Smoothen the tapered bow arms with a sharp machete always starting from the **handle towards the tip** using long even strokes.

(11) Mark how thin to make the Bow Arms from around mid point to about 3/8” (1cm) at the tip. Use the machete and gradually thin the bow arm to your drawn line.

This next photo shows the side view of a Bow Arm that is marked to be shaved thinner.



(12) Match the two Bow Arm base ends (handle part) back to back for the best fit and **choosing which arm will be the forward arm** (away from the archer) **and** therefore **the other will be the rear arm** (nearer the archer). Mark the bow arms properly so you don't confuse them.

Here's a good example of a good pair of forward and rear bow arms.



This next pair, on the other hand, is a poor choice.



Taking the forward bow arm, **shave the INNER SIDE** of the handle portion to about ½” (13mm) to mate closely to the outside skin of the rear bow arm handle.

The **2-piece bow handle must feel fairly solid in your hand** when you grasp the mated handles together.

Here's a photo of 2 properly shaved handle portions mating with each other.

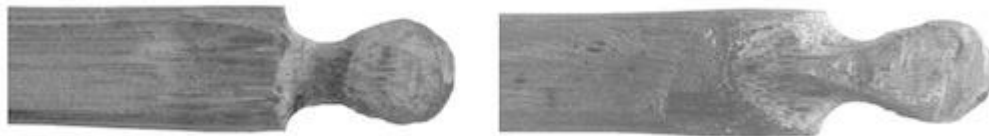


(13) Shave the inner side of the handle portion **of the rear bow arm** to make the combined thickness of the double bow arm handle around 1" (26mm).

(14) Straighten the matched Bow Arms as straight and equal as possible **by gently heating the bends** on the Bow Arm **over a fire** and bending it carefully.

(15) Carve the basic shape of the Bow String tip. Carve smoothing grooves on the tip and make sure there are no sharp corners or edges that will fray the bowstring during use.

Here are a couple of photos of a finished bowstring tip. The one on the left is the front part and the one on the right is the rear part that faces the archer.



(16) Mark the spot where you will drill a 6mm sized hole on each Bow Arm. The holes should be located not more than 1" (25mm) from the end of a Bow Arm of each handle portion. You can use a 6mm Drill bit or the Awl of the Swiss knife to make the holes for the bolts.

This next photo shows where to drill the holes that are not more than 1” (25mm) from the handle end of each bow arm.



(17) After you have made the initial hole on each Bow Arm, **lash the two Bow Arms together** as if you are assembling them together **and finish drilling through the two holes**. Use sandpaper and thoroughly smoothen the two bow arms, rounding the corners along the whole length and smoothening the bow tips very well.

(18) **Assemble your Bow, insert the bolts** and gently tighten the nuts until they are firmly in place. **Do not over tighten, as you may crack the bamboo.**

Here's a photo of a finished bow arm, handle portion.



Below is an assembled Bow with Nut and Bolt.



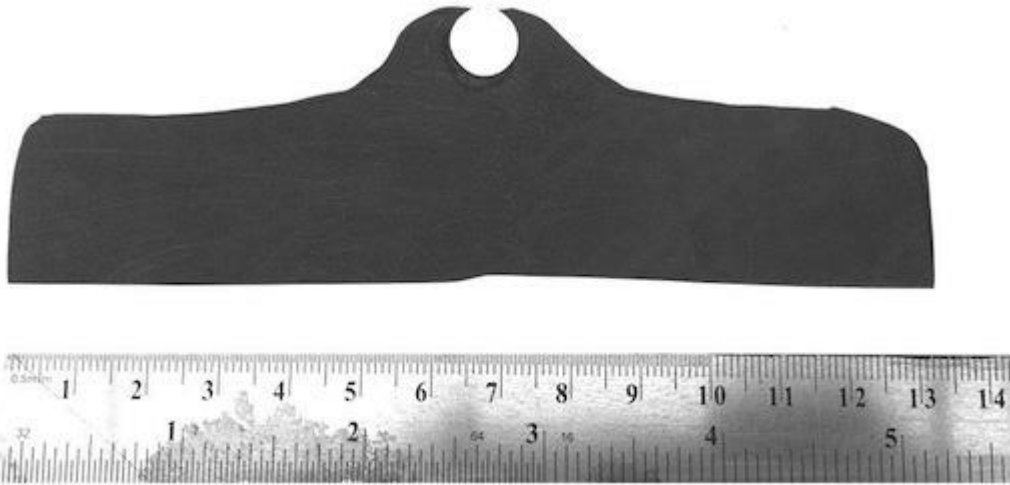
If you do not have bolts, you can make Dowels/Pegs from bamboo and use these in the holes to securely keep the bow arms from twisting when in use.

Below is an assembled bow with removable Bamboo Dowels.



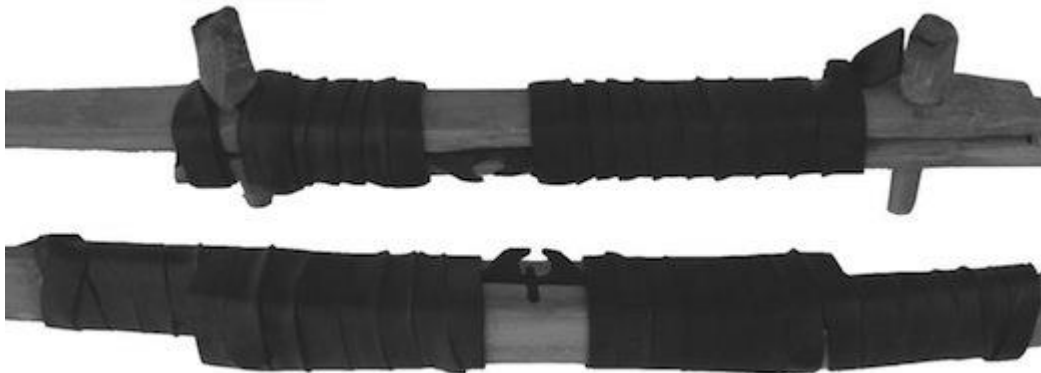
(19) Make a simple Inner Tube Arrow Rest to make your Bow more accurate **and** less painful on the bow hand. **Sandwich the arrow rest between the two bow arms** with the arrow rest hole at the midpoint of the assembled **ambidextrous** bow.

Shown here is an Inner Tube Arrow Rest that is about 5" (13cm) long by 1" (2.5cm) wide. Trim any excess of the arrow rest, once it is installed.



(20) Tightly lash the handle with the Inner Tube.

Shown below are two fully lashed Bow Arms with arrow rests made from Inner Tube Rubber.



(21) Congratulations! Enjoy your bow, made from recycled & renewable materials

D. Bowstring Assembly Steps

(1) Use the medium weight, 3-part wound string. Make a **loop** that will snugly fit the bottom end of one of your bow tips **and splice the string to create the loop**.

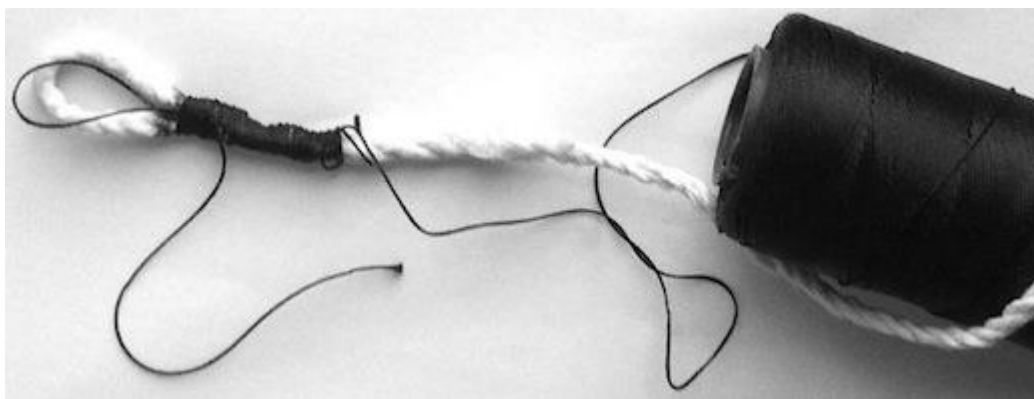
This next photos shows the detail of one way to splice a bowstring loop.



- a- (Left most loop) Mark the size of loop & dip the loop portion in wax.
- b- (2nd Loop from the left), Splice each string.
- c- (3rd from left) A finished splice just prior to twisting them all together
- d- (4th from left) Fully twisted Loop
- e- (5th from left the, rightmost Loop) A fully waxed and finished Loop.

(2) **Wrap the small diameter thread** (“*Simulid*”) just below the loop, then wax the wrapping and the whole bowstring well.

And here's the detail of one way to wrap a bowstring loop.



(3) Bend the bow with the lower bow end **in front of your left ankle**, the bow handle **behind your right knee and your right hand pushing** the upper bow arm making an arch. Reverse the above position if you are left handed.

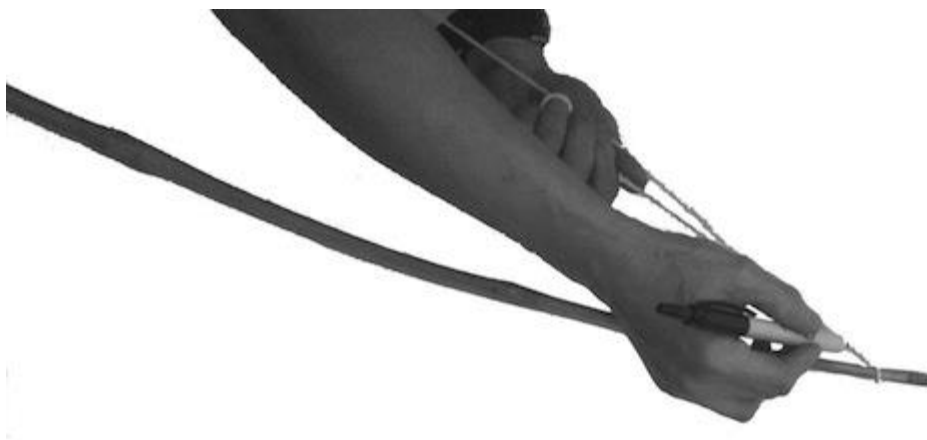
Note: **The Outer Skin side** of the bow should remain visible to you and it **is inside the arch of the bow.**

Here's how to bend a bow in an efficient and simple manner.



(4) Establish the final length of the bowstring by putting the looped end on one bow tip and while bending the bow, looping the other bowstring end at the other bow tip. Mark the location where you will splice the 2nd loop of the bowstring.

Here's an illustration of how to mark the bowstring to determine the correct length for your bow.



(5) Make the 2nd bowstring loop large enough to fit your upper bow arm snugly. Splice and make

a loop similar to the one in Step E1 above. Remember to wrap thread on your 2nd loop as described in Step E2 above.

(6) String the bow into an arch and the bowstring should be about a “Thumbs Up” from the inside part of the handle. You can make minor string length adjustments by twisting the string tighter to make it shorter, or untwisting it to make it longer.

The correct bowstring distance for your bow should be a fist with the archer’s thumb sticking up as shown in this next photo.



- Regularly rub **wax** on the bowstring to give it the longest useful life possible.
- Unstring your bow soon after you use it, do not keep your bow strung over many hours and protect it from getting wet as these will weaken the bow.

E. Arrow (*Palasô*) Assembly Steps

- (1) Choose several pieces of STRAIGHT and DRY reed type grass stalks that are more than 4' (120cm) in length and have a minimum of 5/16" (8mm) in diameter
- (2) The straighter the arrow, the truer it will fly.
- (3) The total length of each arrow should not exceed the length of one bow arm. Cut the arrow tip just above the last section as shown below.



Cut the arrow nock about 1/2" (13mm) beyond the section of the fatter side of the arrow.



- (4) **Check that all arrows are slightly shorter than a Bow Arm.** Note that the length of each arrow may vary a little from each other. Straighten the arrows by heating the reed grass over a hot source or flame and gently bending all the bends straight.

The first photo below is an example of a bent arrow. The second photo shows the same arrow after it was straightened.



(5) If the Nock area is fairly solid, simply **reinforce the nock with super glue and cut the notch directly.**

If there is a large hole in the Nock area push a small amount of well-mixed epoxy into the hole of each arrow.

Here's an illustration of an arrow with a large hole in the Nock area. Fill the hole with Epoxy Clay before cutting the notch.



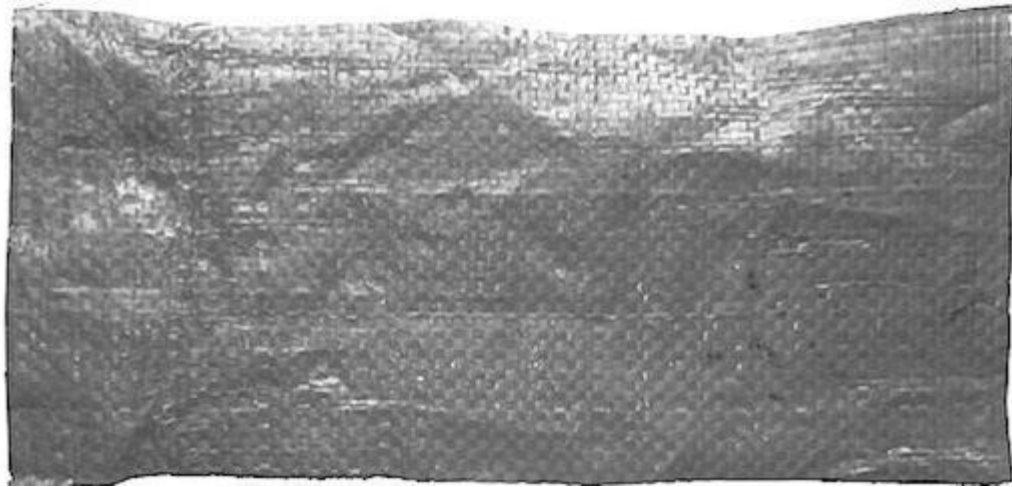
If you do not have any epoxy you can carve a bamboo dowel to size, add super glue or any appropriate wood glue and fit the dowel plug into the hole. Cut the plug flush with the arrow end.

In the following illustration, the notch is cut with a wood saw and the nock is reinforced by dropping some super glue on it, to plasticize the nock.

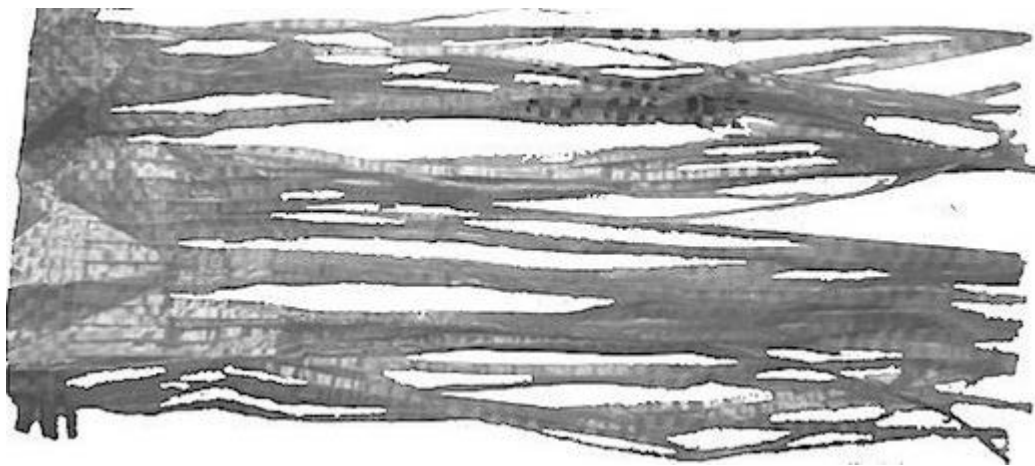


(6) For fletching; use a rice sack or any light and thin cloth.

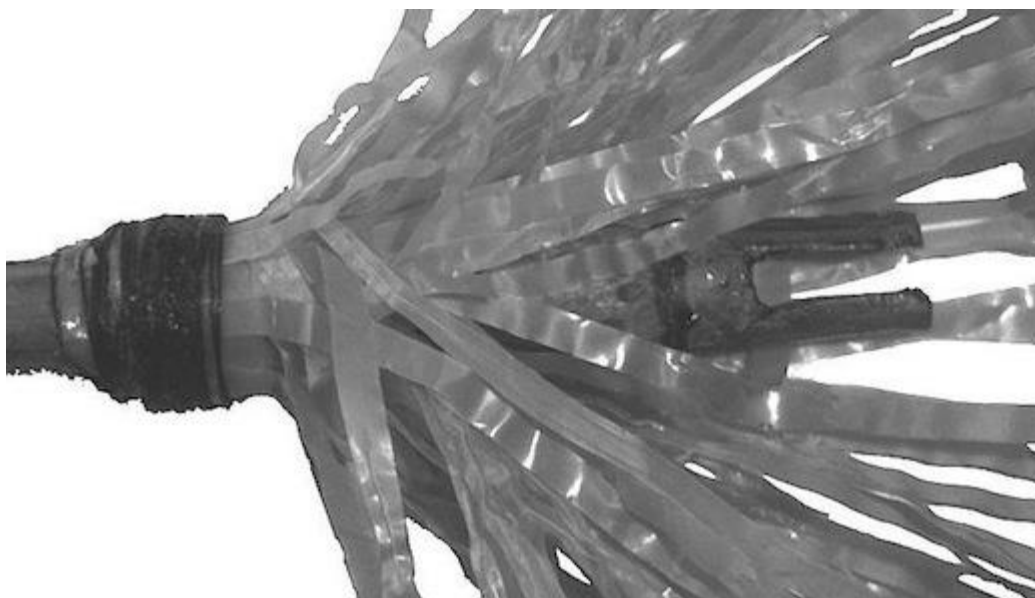
- Cut the cloth into a rectangle of about 3" x 6" (8cm x 15cm).



- Cut and fray the rice sack several times to make ribbons.



- The fletching material is simply glued and lashed with a thread (“Sinulid”) into the arrow rear, giving space for the archer's fingers to grip the arrow nock.

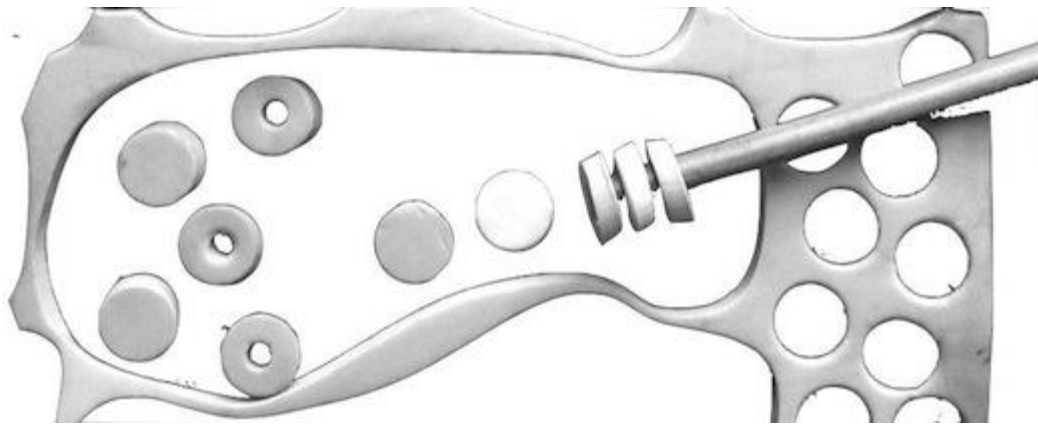


(7) Do not put a sharp arrow head on your arrows. This Bow and Arrow set is intended for safe, simple, economical and fun use by scouts during their various activities and helping the scout earn an Achievement or Merit Badge in Archery.

The arrowhead is made from several cut rubber slipper plugs. Make 2 or 3 round or square plugs with an X-slit or a round hole about 3-4mm in size, push into the arrow tip and secure the arrowhead with a little super glue.

Then glue a couple of rubber slipper plugs without holes to finish the arrowhead tip.

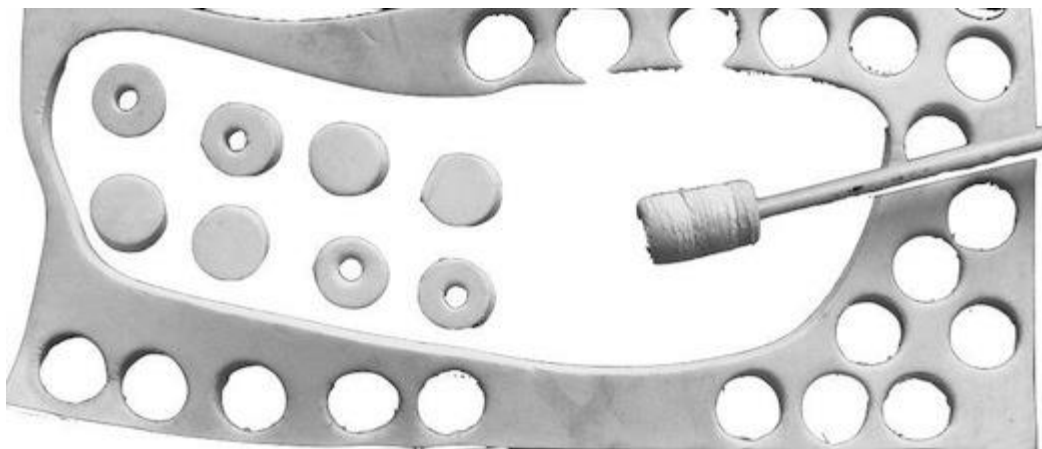
Here's a photo showing the detail of how the slipper rubber plugs can look like.



Have at least $\frac{3}{4}$ " (2cm) of rubber plugs without a hole, at the very tip of the arrowhead. Glue them together with Super Glue.

Make light, soft and bulbous arrowheads that will not injure a person. (Be careful with the eyes, they will get injured if hit by an arrow!)

And this is what a finished Slipper Rubber Arrow Head that is easy to make and use looks like.

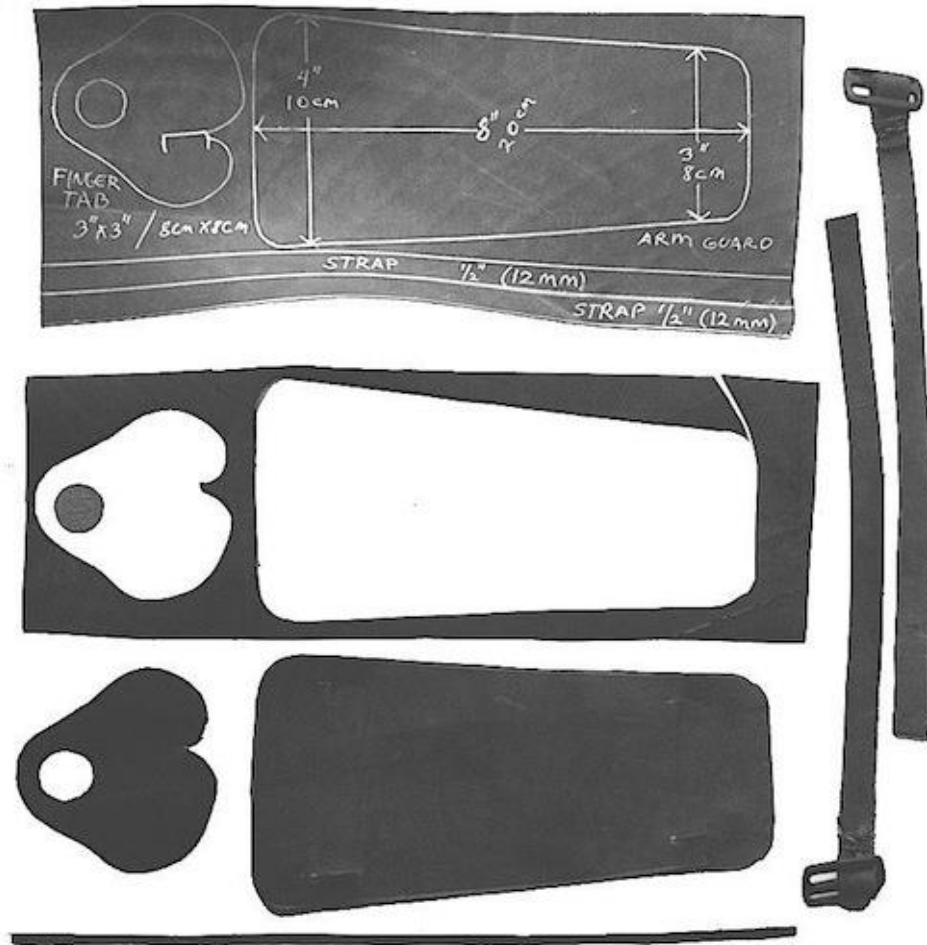


You can use sandpaper to smoothly shape the Arrow Head.

F. Finger Tab instructions

Cut a piece of Inner Tube Rubber to suit the size of your hand in the shape as seen in the photo below. Use a small coin (25 centavo) for the appropriate size of the finger hole.

Photo below shows how to layout the Finger and Arm Guards on a rectangular piece of inner tube rubber.

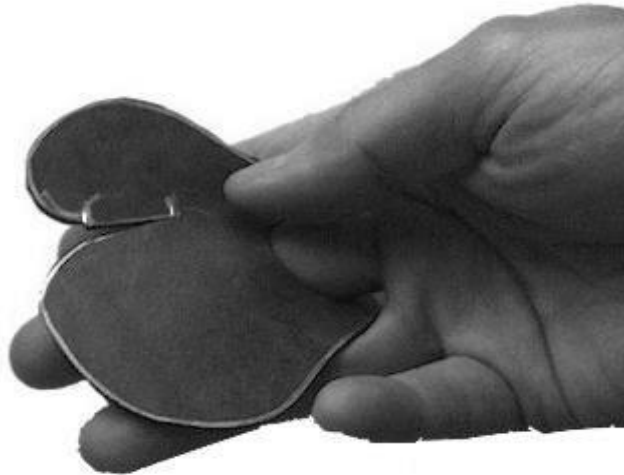


G. Arm Guard Instructions

Cut Inner Tube Rubber (can also be made with leather, leatherette, soft tree bark, thick cloth, etc.) to suit the size of the inside forearm/wrist area of your Bow Hand.

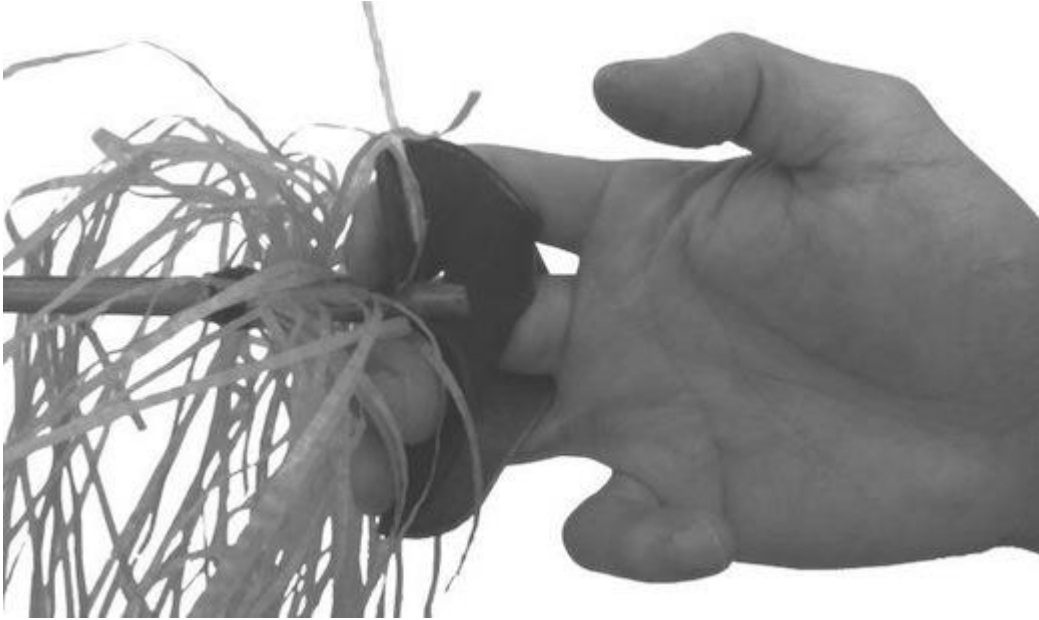
Note: This safety gadget will eliminate the pain from your arm getting slapped by the bowstring upon release.

Here's how to use the finger and arm guards.

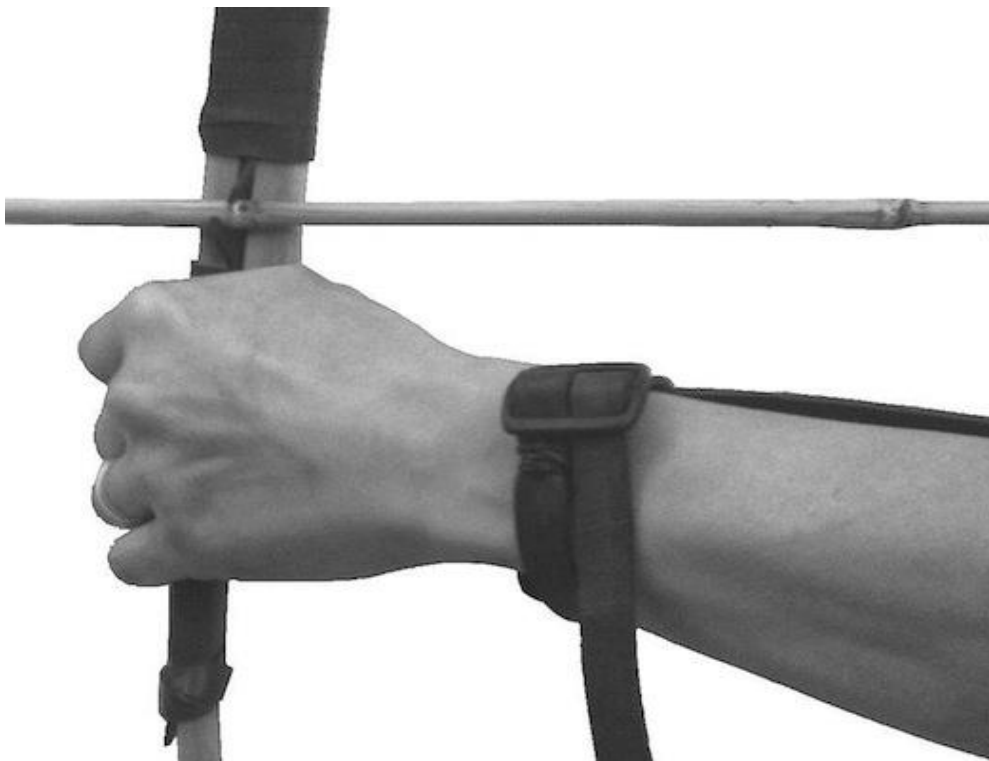


H. Simple Shooting Instructions

Here's how to hold an arrow on the bowstring with 3 fingertips.



How the arrow should rest on the Arrow Rest above your bow hand.



How to stand properly while shooting.



This is what your site picture should look like when you have sighted and are about to release the arrow:



Note: Do not move after releasing the arrow, wait until you see where the arrow has hit; this is called "the Follow Through" which is important for accuracy.

I. Dos and Don'ts

DO know where you are aiming and where your arrow will most likely strike.

DON'T shoot where there are people or breakable objects.

DO have a responsible adult with you when you are shooting your bow.

DON'T release the string when there is no arrow nocked. This may damage the bow, snap the string and cause an injury.

ALWAYS think, "**Safety First!**"

J. Targets

Targets can be Plastic Gallon (4 Liter) Jugs, woven baskets, a piece of cloth, etc. Hang the targets from a branch a few feet above the ground or almost touching the ground. Any hits will cause the target to move and the archer can easily see this.

Care must be taken to **ensure there is a SOFT arrow backstop**.

Set-up a fun, easy to use Archery course where the targets can be laid along a walking path in the jungle, countryside, a city park, a large garden or even inside a building and the archer just walks, searches for the target, shoot, count his hits, collect his arrow/s and have fun! The appropriate target distances are from 15feet to 30feet (5 to 10 meters) only.

With proper course design and safe backstops, you can easily handle many scouts entering the archery range in one end, walking out at the other end and easily returning the Archery Set back to the starting line for the next scout to use.

K. Closing Notes

If you discover other materials, other effective methods that are easy to do or you have any corrections or suggestions for improvements on the Bow and Arrow Scout set, please email me at jedelgado@scouts.com.ph and let me know! Thank you!

JEDelgado

~oOo~

Please see below, the BSP Archery Merit Badge Requirements, as approved by the NEB in 2010:

Archery Merit Badge requirements

If you have actively participated in competitive archery events and can show the awards and/or certificate as proof of your participation, you have earned your Merit Badge in Archery or:

In a BSP National Program sanctioned archery event do the following:

- a. Learn archery safety rules.
- b. Learn the parts of an arrow and the parts of a bow.
- c. Learn to use the following accessories – arm guard, shooting glove or finger tab, quiver.
- d. Shoot with bow and arrows at a properly set-up target.

Have your Coach and Unit Leader sign your merit badge application form/card for satisfactorily passing the above-mentioned requirement.

ABOUT THE AUTHOR

The author, JED (Jose Eduardo Delgado), has been a scout since he was 10 years old. As a scout he attended the 13th World Scout Jamboree in Japan (1971) and as an IST, the 14th World Scout Jamboree in Norway (1975). As an adult leader he was the BSP Deputy Contingent Head in the 21st "Scout Centennial" World Jamboree in England (2007) and the BSP Contingent Head in the 22nd World Scout Jamboree in Sweden (2011).

JED has held various positions in Scouting: He was the Manila Council Board Chairman in 1991-92; A National Executive Board Member since 2005; Chairman of the Program, Adult Resources, and IT Committees since 2009; and the Chairman of the APR (Asia Pacific Region) Youth Program Sub-Committee for 2009-2012.

JED is a licensed single-engine private pilot, tech diver, hard enduro motorcycle rider, technical mountain/rock climber, sky diver, sporting clay shooter, combat pistol shooter, competitive archer, runner, history buff and an inventor. He is also an avid traveller.

JED's personal experiences and numerous adventures have given him a deep insight in designing and creating affordable, practical and properly engineered, products and gears for climbing, scuba diving, hard enduro motorcycling, camping, other sports and daily life.

JED is happily married to Margarita since 1980 and has four children: Paolo, Clarissa, Camille, and Anton. He has his home in Makati City, Philippines.

