

# Novice Boffer Mace

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~Dagorhir Construction Tutorial ~



Bro'gar  
of the House Volant  
First Knight of Myrmidon

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# 1 Getting Started

## 1.1 Materials



Figure 1.1 Required Materials

Materials	Quantity
½” SCH40 PVC Pipe	32” (or any length <32”)
Ozark Trail “Blue” Camping Pad	1/3 Roll
DAP Contact Cement	4oz (1/8 <sup>th</sup> of a quart can)
Duct Tape	*
Strapping Tape	*
Carpet Tape	*
Cloth Tape (any color)	*
Colored Electrical Tape	*
Cloth (any solid non-neon color)	appx. ½ yard section (makes 3 mace covers)
Thread	*
(optional) Gold’s Gym Yoga Mat	*
(optional) Floor Mat Foam (#4 foam)	*
(optional) Gorilla Tape	*

### Optional Materials

- Yoga mat is for stab legal weapons; this is not required, but is very useful.
- Floor mat foam can be used for the biscuit.
- Gorilla tape can be used instead of duct tape

Cost per weapon: ~\$7.00

## 1.2 Tools



Figure 1.2 Required Tools

- Sharp Cutting Knife
  - Thin blade retractable kind is recommended
- Sharpening Stone
- Scissors
- Permanent Marker
- Tape Measure
- File
- Straight Edge
  - Shown is a 1.25" x 1/8" x 36" aluminum bar. This can also be used to quickly cut strips to an exact size
- Sewing Machine
- (optional) Measuring Tape (ribbon kind)
- (optional) Chalk
- (optional) Paint Brush

## 2 Preparing the Core

### 2.1 Cutting the Core

- ½” PVC makes a good single handed weapon core, but is too flexible at longer lengths. A good typical core length is 32” or 30”, any longer will likely fail flex.

### 2.2 Deburr and Break Edges

2.2.1 Use a file to clean off any loose pieces of PVC from the inside and outside of the pipe.



Figure 2.1 Cleaning the Pipe Ends

2.2.2 Next break the edge around the end of the pipe so it isn't sharp.



Figure 2.2 Break the Edge

### 2.3 Cap the Core

2.3.1 Pick the flattest end for the tip of your weapon so the tip is more stable.

2.3.2 Since the core is hollow, we will need to cap it off. Place duct tape in an X pattern twice so there is 4 layers of duct tape total over the end of the core. Only cap one end for now so it's easier to tell which end will be the tip of your weapon.

- You can also use leather, rubber, or a coin taped down to cap the core as long as there is not a hard edge of the cap overlapping the edge of the core.

### 2.4 Biscuit Tip

2.4.1 Cut a circle of foam the same size as the tip of the core. This piece must be the same size or a little larger than the core. If it's smaller make a new one to fit. This foam piece is known as a “biscuit”.

2.4.2 Cut a 4” piece of strapping tape and split it in half. Set aside

2.4.3 Place the foam circle on the tip of your weapon, press down firmly to fully compress the foam, and use the strapping tape pieces to tape it down with an X pattern. Follow by wrapping with another piece of strapping tape to secure the ends of the tape.

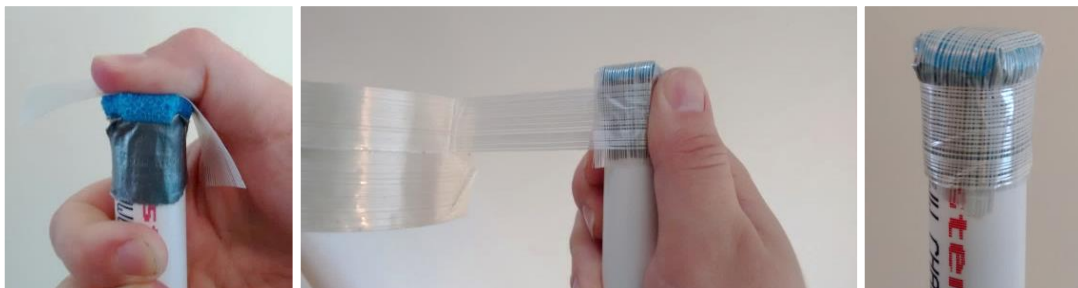


Figure 2.3 Biscuit the Tip

### 3 Preparing the Foam

#### 3.1 Cut a 12.5" x 14.5" Rectangle

3.1.1 Trim an angle into the 12.5" long edge as shown.

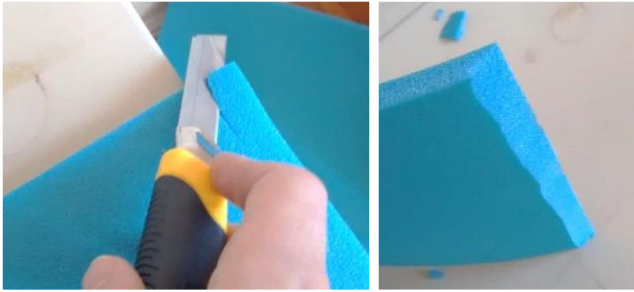


Figure 3.1 Trim Angle on 12.5" Edge

#### 3.2 Cut Six (6) 1.25" x 14.5" Strips

- Note: These strips and the above piece can be cut from a 14.5" section of camp pad

#### 3.3 Cut Three (3) 1.25" x 20" Strips

#### 3.4 Cut Six (6) 1.25" x 5" Pieces

3.4.1 Trim an angle on the end of each piece as shown.

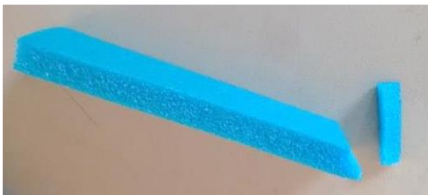


Figure 3.2 Trim the End

#### 3.5 Cut a Foam Disk to Match the End of Your Core (~7/8" diameter)

When you are done, you should have

- 12.5" x 14.5" 1 piece
- 1.25" x 14.5" 6 pieces
- 1.25" x 20" 3 pieces
- 1.25" x 5" 6 pieces
- End Cap 1 piece

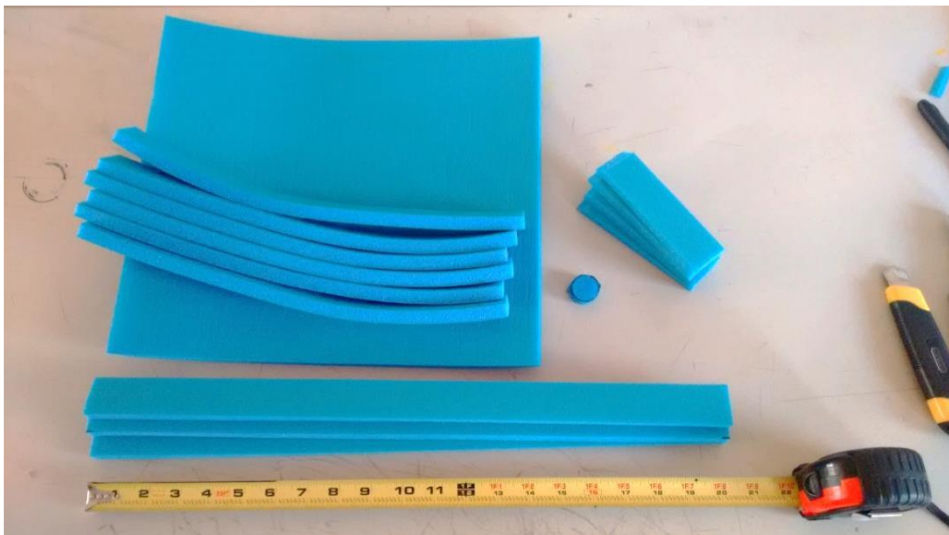


Figure 3.3 Foam Strips

## 4 Striking Layers

### 4.1 End Cap

4.1.1 DAP the end cap and the end of the core.



Figure 4.1 End Cap

4.1.2 Let dry for 15 minutes.

4.1.3 Place the end cap on the end of the core. Press firmly to ensure full contact.

### 4.2 Barrel Wrap

4.2.1 DAP both sides of the 12.5" x 14.5" piece leaving the last 8" of the outside face without DAP, then lay on its edge. Also DAP the last 13" of the core near the tip including the sides of the end cap.



Figure 4.2 Barrel Wrap

4.2.2 Let dry for 15 minutes.

4.2.3 Match the top of the end cap with the inside corner of the rectangle near the angled edge. Lay the core parallel to the edge of the rectangle. If you don't lay the core straight you must pull the pieces apart and re-DAP before trying again.



Figure 4.3 Match Edges

- 4.2.4 Press the angled edge of the foam up against the core so there is no gap.
- 4.2.5 Begin to roll the foam by lifting up on the core and lightly pressing inward on the foam, allowing the foam to fold over and begin to roll. Continue this motion of pressing inward and rolling as you go. This prevents the foam from being stretched while rolling.



Figure 4.4 Press Inward While Rolling

- 4.2.6 Press firmly along the entire length of the foam to ensure full contact.
- 4.2.7 Next use a sharp knife to shave off the corner of the foam so the final shape of the barrel wrap is rounded. This is easier with a couple cuts rather than a single cut.



Figure 4.5 Round the Edge

### 4.3 End Layers

- 4.3.1 Using the end of the weapon to measure, trace and cut two disks of blue foam.
- 4.3.2 (optional) If you are adding a stabbing tip, also trace and cut two disks of yoga mat.
- 4.3.3 DAP the top and bottom of one blue foam disk, just the bottom of the second blue foam disk, and the end of the weapon.



Figure 4.6 End Layers

- 4.3.4 Let dry for 15 minutes.
- 4.3.5 Place the disks on the end of the weapon, starting with the piece that has DAP on both sides and matching with the edge of the weapon tip. Firmly press the layers onto the tip.



#### 4.4 Flange Layers

4.4.1 DAP the six (6) 1.25" x 14.5" layers and around the outside face of the weapon.



Figure 4.7 Flange Layers

4.4.2 Let dry for 15 minutes.

4.4.3 Matching the end of each strip with the end of the weapon lay the strips along the length of the weapon in a hexagonal pattern.



Figure 4.8 Hexagonal Pattern

4.4.4 Trim the ends of the strips so that they match the end of the barrel wrap layer.

#### 4.5 (optional) Stabbing Tip

4.5.1 Using the two pieces cut on step 4.3.2, DAP the top and bottom of one yoga mat disk, just the bottom of the second yoga mat disk, and the end of the weapon.

4.5.2 Let dry for 15 minutes.

4.5.3 Place the disks on the end of the weapon, starting with the piece that has DAP on both sides and centered on the tip of the weapon. Firmly press the layers onto the tip.

## 5 Haft Padding

### 5.1 Spiral Wrap Haft Padding

- 5.1.1 Wrap one 1.25" x 20" strip around the core and mark perpendicularly across from the end of the strip, as shown below, then cut along that mark.

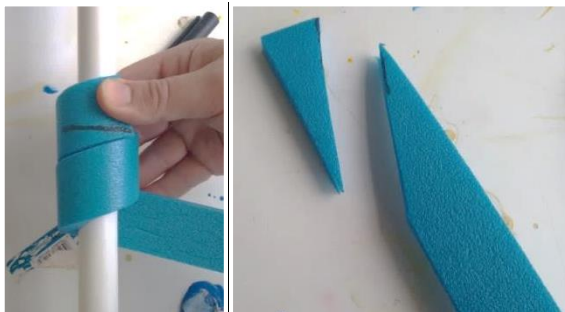


Figure 5.1 Angle Cut for Spiral Wrap

- 5.1.2 Mark the core 12" down from the base of the striking surface.  
5.1.3 DAP the core from the base of the striking surface up to the 12" marking. Also Dap the 1.25" strips, including the ends of the strips.



Figure 5.2 Spiral Wrap Layer

- 5.1.4 Let dry for 15 minutes.  
5.1.5 Starting at the base of the striking surface, spiral wrap the 1.25" strips around the core starting with the angled piece. As you spiral, press inward on the last layer and overlap the layers by 1/8" so there is no gap between the layers.



Figure 5.3 Press Inward on Previous Layer

- 5.1.6 Continue the spiral wrap with the other 1.25" strips until you pass the 12" mark on the core. To join strips together, press the end of the next strip into the end of the previous strip so that it compresses the two slightly. While pressing inward on the previous layer, lay the strip over so it contacts the core and then continue the spiral wrap using the method from section 5.1.5. This is important to prevent gaps in the haft padding.

- 5.1.7 The spiral wrap should have ridges between each of the strips where the foam is overlapping; this is good because it means there will not be a gap in the haft padding. To smooth out the haft padding, pull the upper edges of the strips apart slightly so they press back together evenly. Continue this along the length of the spiral wrap.
- 5.1.8 Mark 8" up from the pommel end of the mace and trim the spiral wrap perpendicular to the core. This allows ~6" for handle and ~2" for pommel. You can also have a shorter/longer handle if desired, as long as it is less than 1/3 the finished length of your weapon.

## 5.2 Second Haft Padding Layer

- 5.2.1 DAP the six (6) 1.25" x 5" strips from section 3.4 and the upper 5" of the haft padding.

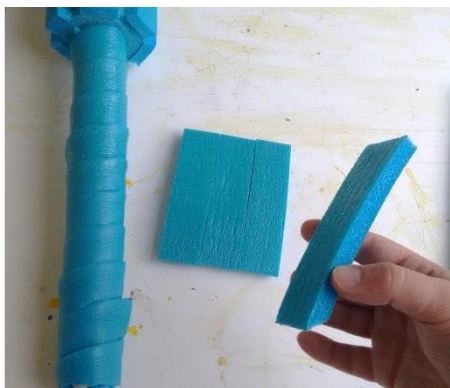


Figure 5.4 Second Haft Padding Layer

- 5.2.2 Let dry for 15 minutes.
- 5.2.3 Place the 1.25" x 5" strips over the spiral wrap in a hexagonal pattern, starting at the base of the striking layer with the angled edge away from the base of the striking layer.
- 5.2.4 Wrap the haft padding with cloth tape, starting at the base of the striking surface and slightly overlapping with each layer.
- When crossing where two strips joined, pull the tape tightly to smooth the bump.
  - When stepping down across the layers, finish the wrap so it overlaps the step and then start a new wrap at the base of the step.



Figure 5.5 Cloth Wrap Haft Padding

## 6 Pommel and Handle

### 6.1 Pommel Padding

- 6.1.1 Cap the end of the core with duct tape like shown in section 2.3.2.
- 6.1.2 Cut a 1.5” wide strip of camping pad, about 20” long.
- 6.1.3 Wrap the 1.5” strip around the pommel end and mark where the strip crosses the center of the starting edge as shown. Then cut the strip where you have marked. Set aside.



Figure 6.1 Measuring the Strip

- 6.1.4 Wrap the pommel end with carpet tape, slightly overlapping at the ends.
- 6.1.5 Remove the backing off the carpet tape and wrap the 1.5” foam strip around the pommel. Pull the ends of the strip together, they should just barely overlap, and secure with a piece of duct tape.



Figure 6.2 First Pommel Layer

- 6.1.6 Cut a circle of camping pad to match the end of the pommel.
- 6.1.7 Place a square of carpet tape on the end of the pommel then remove the tape backing.
- 6.1.8 Place the foam circle on the end of the pommel and press together.
- 6.1.9 Repeat steps 6.1.3-6.1.8, so that you have wrapped and capped the pommel twice. Use carpet tape between each layer.



Figure 6.3 Wrap-Cap-Wrap-Cap

## 6.2 Six (6) Duct Tape Straps

- 6.2.1 Using 1" width strips of duct tape, tape a six-cross pattern over the pommel with ~2" of tape overlapping the handle section at each end. Be careful to not compress the foam corners at the top when laying tape over the end. This is easier if you measure out the sections first and lay them from the top down.

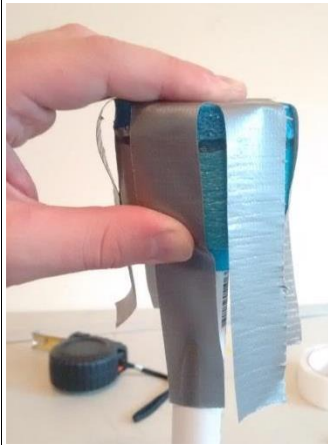


Figure 6.4 Duct Tape Six-Cross

- 6.2.2 Squeeze the handle at the base of the pommel padding to slightly compress the base of the pommel padding and to press the duct tape against the handle.

## 6.3 Three (3) Duct Tape Anchors

- 6.3.1 Using 1" width strips of duct tape, anchor the pommel three times.

6.3.1.1 Place the tape on the pommel, pointing at an angle downward.

6.3.1.2 Wrap down, looping around the handle. It is important that you loop on the handle.

6.3.1.3 Continue the loop upward and wrap around the pommel at a natural angle.

- Keep the tape taunt during this process so that the anchor is tight.
- Place the three anchors at an even spacing around the pommel.

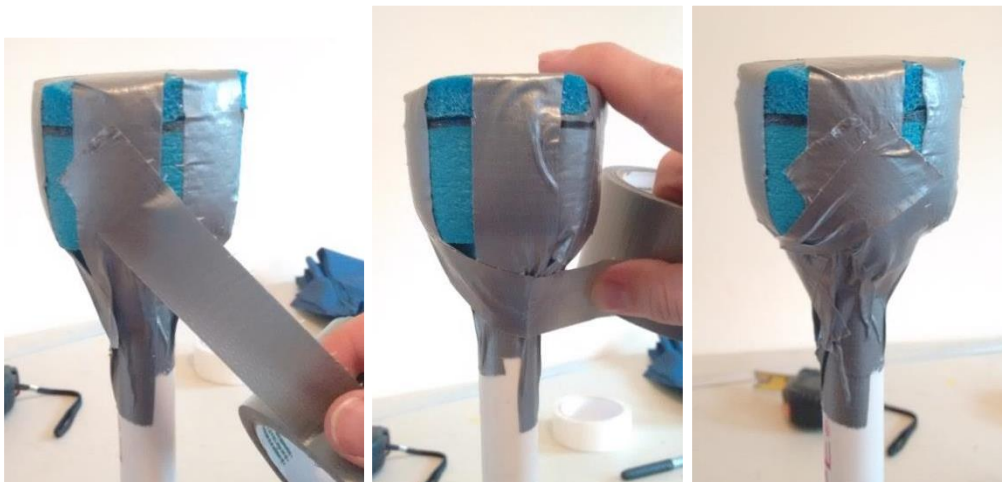


Figure 6.5 Duct Tape Anchor

## 6.4 Three (3) Duct Tape Torque Wraps

6.4.1 Using a full width strip of duct tape, torque wrap the pommel three times.

6.4.1.1 Place the tape on the pommel, pointing at an angle downward.

6.4.1.2 Wrap down, fully compressing the foam, and loop upward similar to the anchors. This layer should mostly cover the pommel padding and compress it as much as possible.

6.4.1.3 Continue the loop upward and wrap around the pommel at a natural angle.

- Place the three torque wraps at an even spacing around the pommel.

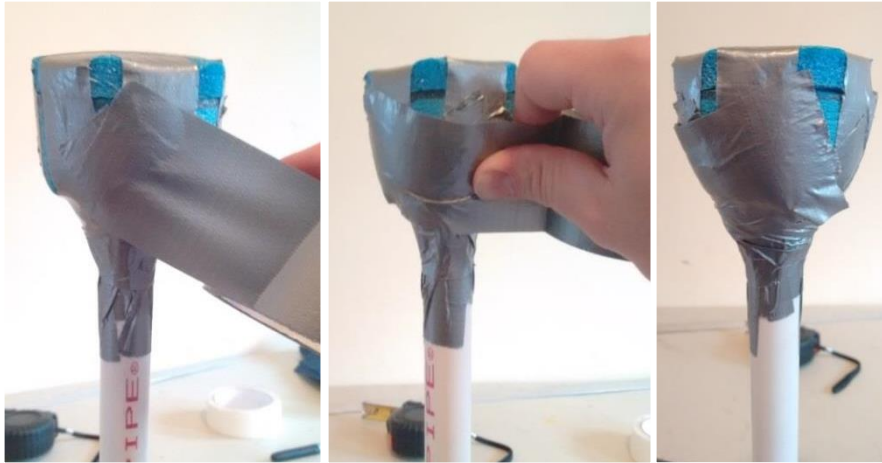


Figure 6.6 Duct Tape Torque Wrap

## 6.5 Cloth Tape

6.5.1 Cut a 6" square piece of cloth (any color).

6.5.2 Center the cloth on the end of the pommel and tape down with cloth tape. Tape the side of the pommel up to the end as shown.



Figure 6.7 Cloth Pommel Cover

6.5.3 Wrap cloth tape in a spiral starting at the top of the handle. It's important to start at the top because it prevents the tape from rolling up under your hand when you stab.



Figure 6.8 Wrap Handle with Cloth Tape

## 7 Cover

### 7.1 Measure the Blade

7.1.1 Measure the perimeter of the weapon blade, and then add 1" for hem. For this mace, the width of the cover cloth is 12.75"



Figure 7.1 Blade Perimeter

7.1.2 Measure the blade length allowing 1.5" extra at the handle end and rounding up to the nearest inch that passes the center of the tip. For this mace, the cover length is 18".



Figure 7.2 Blade Length

### 7.2 Cut Cloth for Cover

- The following method is a quick way to cut multiple weapon covers. You can also simply cut a rectangle of fabric (e.g. the cover for this mace is 12.75" x 18").

7.2.1 Lay your cloth flat on a wide table.

7.2.2 Mark  $\frac{1}{2}$  the cover length (e.g. 9") from the fabric end on each side then fold the cloth over on itself across these marks, matching the edges as shown. Check the dimension of the folded cloth afterwards to make sure it is  $\frac{1}{2}$  the cover length.

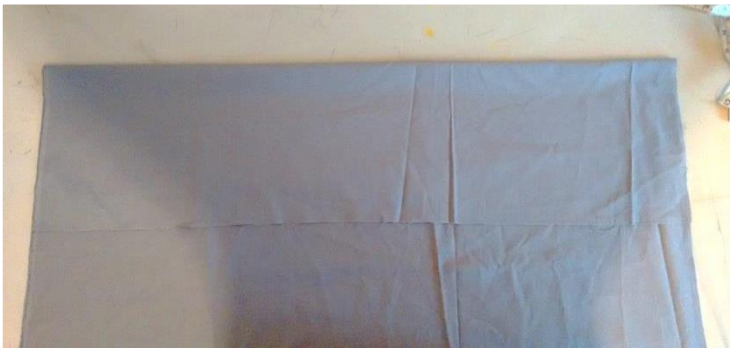


Figure 7.3 Cloth Folded Once

- 7.2.3 Fold the cloth again lengthwise, matching the folded edge with the end of the previous fold. This section should now be  $\frac{1}{4}$  the cover length.



Figure 7.4 Cloth Folded Twice

- 7.2.4 Next measure and mark the width of your cover (e.g. 12.75”) along the top and lower edge of the fold you just made. With a straight edge, draw a line to connect these marks then cut along this line with a pair of sharp scissors. Also cut along the cloth where it is a single layer below your fold as shown.

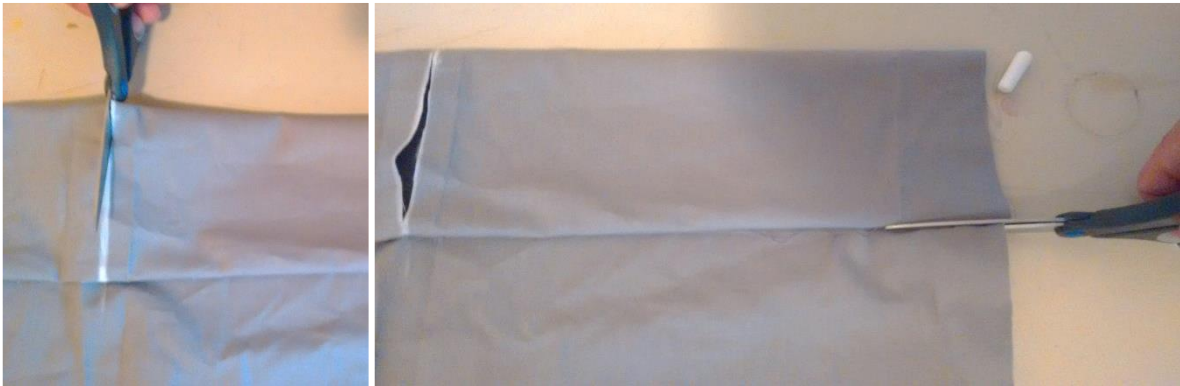


Figure 7.5 Cut Cloth Along Line and Below Fold.

- 7.2.5 This process can be repeated along the length of the fold to cut out multiple covers of the same length.

### 7.3 Sew the Cover

- 7.3.1 Fold the cover in half across the width of the cover and sew the sides to make a tube. While sewing, keep the seam straight and at a  $\frac{1}{2}$ ” distance from the edge.
- Don't forget to backstitch when you start your seam



Figure 7.6 Sew the Long Edge



- 7.3.2 (optional) Lay the cover flat with the seam facing up and iron the seam open. This removes creases from the cover so it will lay flat on your weapon.



Figure 7.7 Press Seam Open and Flat

- 7.3.3 Sew a straight line across the end of the cover, leaving  $\frac{1}{2}$ " hem at the end.  
7.3.4 Fit the cover over your weapon to find where the "dog ears" are at.



Figure 7.8 Dog Ears

- 7.3.5 Pinch the dog ears flat and mark the base of each dog ear along the edge of the weapon as shown. When marking, make sure that the dog ears are even on both sides. Mark the base of the dog ears up to where the base of the dog ear meets the edge of the weapon.



Figure 7.9 Mark the Base of the Dog Ear

- 7.3.6 Lay the cover where the dog ears are flat and sew along the marks one at a time, checking beneath the dog ear that you are only sewing at the base of the dog ear. At the start and end of the seam, sew as close to the edge as possible.



Figure 7.10 Sew the Base of the Dog Ears

- 7.3.7 Trim the excess at the end of the dog ears, leaving  $\frac{1}{2}$ " of material past the seam.
- 7.3.8 Turn the cover right-side out and fit it over the striking surface. This should be a tight fit to help protect the weapon. Double check the tip of the cover, if there are loose sections this can be fixed by taking the cover off and resewing that section of the hem. Loose corners on a weapon will likely fail at weapon check.



Figure 7.11 Finished Cover

- 7.3.9 Pull any slack down and out of the cover then attach to the handle using cloth tape.
- 7.3.10 If you added a stabbing tip to your weapon, also mark the handle with green tape.

### Your Boffer Mace is complete!

For the best weapon durability, allow the weapon to cure for one week before use.



Figure 7.12 Finished Weapon

# Appendix A: General Foamsmithing Tips

## DAP Contact Cement

- Don't wear nice clothes when using DAP, it will not come out of clothing.
- Always DAP outside in a well ventilated area.
- DAP acts differently on different foams.
  - Blue foam will collect excess DAP on the surface, which can be scrapped off for reuse.
  - Marine foam will dry DAP very quickly.
  - Floor mat foam will absorb the first coat of DAP, so always recoat after a few minutes.
- Don't use too much DAP, there should be just enough DAP to tell that there is DAP on the surface (i.e. no dry spots). Using too much will waste DAP, make your weapon heavier, and make it take longer to dry.
- An easy way to tell if you used too much DAP on a surface is to scrape a piece of blue foam over the surface. All of the puddling DAP is excess.
- After attaching the pieces, always press the foam together along the entire surface to insure full contact.
- Don't DAP in cold or wet weather
  - DAP needs to dry to cure and it will take longer for the DAP to tack and could ruin the bond.
- The recommended solvent for DAP is mineral spirits. This can be used to clean your hands or work surfaces.
- It takes 7 days for DAP to cure to full strength. Using your weapons before this time will reduce their lifespan.

## Foam

- Reverse rolling the camp pad and letting it sit for ~30mins will make it easier to work with.
- The foam has a curve based on which side was on the outside/inside. In general it's easier if you work with the outside of the roll on the outside of your weapon so the foam doesn't try to peel up.
- Keep your blade sharp when cutting; foam can quickly dull a blade so if you notice that your knife is not cutting as easily or you need to use extra force then it is time to sharpen.
  - Forcing a knife to cut is the quickest way to cut yourself by accident; a knife should cut on its own with little force, and if it's not then it needs to be sharpened.
- When cutting, use a clean flat surface and hold your knife perpendicular to the foam.
  - A sharp blade can cut through foam easily, and it is easy when going fast to get wavy or crooked cuts. Take your time and get used to cutting straight and square, this will make your foam pieces easier to build with and your final product will look cleaner.
- Use a straight edge when cutting to keep your lines straight.
- All closed cell foams have "cells", which are bubbles within the foam. A small cell size increases the durability and wear characteristics of the foam. This is why people often use "microcell" foam instead of blue camping pad. Microcell costs twice as much and must be ordered in quantity, but hits smoother and lasts longer.
- The most commonly used foam in boffers is 2lb/ft<sup>3</sup> density, referred to as 2lb or 2# foam. This is used for the striking surface of the weapon; blue camping pad is 2lb foam. 4lb foam is used as structural support near the weapon core with thinner weapon cores (e.g. 0.5"), but it is not necessary on larger cored weapons.

## Tape

- There are many kinds of tape used in foamsmithing
  - Strapping Tape - tip reinforcement, blade covering, securing the pommel
  - Duct Tape - building the grip, securing/covering the pommel
  - Gorilla Tape - same uses as duct tape, but much stronger
  - Cloth Tape - haft covering, grip covering, pommel covering, securing the cover
  - Packaging Tape - blade covering
  - Electrical Tape - weapon class marking (blue/red/green)
- Don't use electrical tape for haft covering; the foam will break down faster than it would with cloth tape.
- Don't use duct tape on the striking surface; duct tape is thick and stiff and will make the weapon hit harder.
- Some foams do not have a "skin" layer like blue foam, and using a layer of packaging tape or strapping tape over the surface will help protect it. Although in general it is better to have a tight fitting cover over the foam.
- When taping over a striking surface, tape it all or tape it none. Leaving an edge of tape over the striking surface will create a stress riser that will eventually rip the foam.