

## Ball Head Rivets

### Using the Riveting Essentials<sup>†</sup> Tools

By Gwen Youngblood

The Riveting Essentials Riveting Tools<sup>†</sup> are a unique patent-pending set of tools designed by Gwen Youngblood to make riveting easy-peasy and nearly foolproof. Rivets are formed with short pieces of wire, which are passed through holes in the jewelry pieces and the ends of the wire are flattened to secure the pieces in place. The wire used to form the rivet must be of the proper diameter, and fit snugly in the holes. And more importantly, the wire must be cut to the proper length—too short and the rivet will not be secure; too long and the wire will bend instead of flatten. Learning to cut the rivet wire to the correct length to form the rivet properly has been the “trickiest” part of learning to rivet, usually requiring a great deal of practice. In this tutorial, students will learn to use the Riveting Essentials Rivet Gauges<sup>†</sup> to cut the rivet wire to the correct length every time. In addition, students will learn to use the Riveting Essentials<sup>†</sup> Tiny Dapping Block to maintain the round head of the ball-head rivets. Students will also learn some simple metal working techniques.



#### Materials List

- Copper and silver sheet metal, 24 or 26 gauge
- Large bead cap
- 9 inches of 14 gauge fine silver round wire, or
- 9 inches of 16 gauge fine silver round wire, or
- 9 inches of 18 gauge fine silver round wire

#### Tool List

- Riveting Essentials<sup>†</sup> riveting tools
- Chasing hammer
- Plastic mallet or rawhide mallet
- Bench block with pad
- Shape template(s)
- Permanent marker (fine tip Sharpie)
- Wubbers Classic Medium Flat Nose Pliers
- Wubbers Classic Chain Nose Pliers
- Safety glasses
- Pro-Polish Pads
- Flat #2 hand file
- Center punch
- Utility/household hammer
- Butane torch
- Cross-locking tweezers
- Metal shears or jeweler's saw with 4/0 saw blades for 24 gauge metal or 6/0 saw blades for 26 gauge metal
- Texture hammer(s), such as the Fretz No. 13 Sharp Texture Hammer
- 1.8mm hole punching pliers
- Drill (Hand drill, Dremel or Flexshaft) with #52, #56, and #60 drill bits
- Liver of sulfur
- Sandpaper – 300 grit or finer
- Round diamond needle file
- Plastic fork
- Flush cutters rated for at least 14 gauge wire
- Quench bowl
- Metal window screen
- Butane
- Heatproof work surface

## Cutting, Texturing, and Shaping the Metal

**Step 1.** Gather two contrasting metals, a bead cap, two templates, one a circle template and a permanent marker, such as a Sharpie. In this tutorial, 26 gauge copper and sterling silver are used.

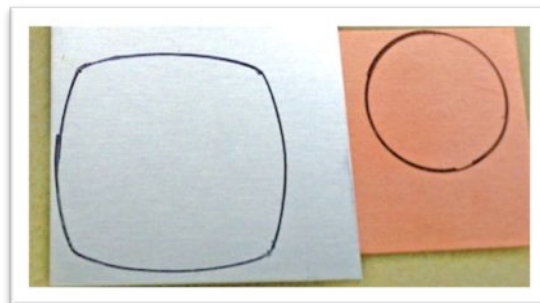
Templates are available from a variety of sources, such as office supply stores, hobby stores and online sources. The ones used in this tutorial are templates used by precious metal clay (PMC) artists to shape PMC.



**Step 2.** To determine the best size of the top metal piece (copper in the example), place the bead cap on top of the metal and lay the circle template on top. Repeat until the best proportion of metal to bead cap is revealed. There is no rule for this step – this is an aesthetic choice.



**Step 3.** Using the template and the permanent marker, trace the shape onto the metal.



**Step 4.** Using either metal shears or a jeweler's saw, cut the traced shape from the metal.

If using a jeweler's saw, size 4/0 saw blades are needed to cut 24 gauge metal. Size 6/0 saw blades are required to cut 26 gauge metal.

Pro-Polish Pads can be used to remove any remaining permanent marker from the metal.

If there are any sharp places on the edge of the metal, use the flat hand file to gently file the edge to remove the rough spots and refine the shape. Hold the edge of the metal flat against the surface of the file. Push the file away from you to remove the excess metal.

**NOTE:** Jeweler's files only work on the "push"—no need to work the file back and forth.



**SAFETY TIP:** ALWAYS wear safety glasses when cutting wire and metal— small pieces of wire or metal can fly into unprotected eyes.

**Step 5.** Many methods exist to texture metal. For this project, two different textures are used—a piece of screen and a Fretz No. 13 sharp texture hammer. These are used to impart added interest to the metal.

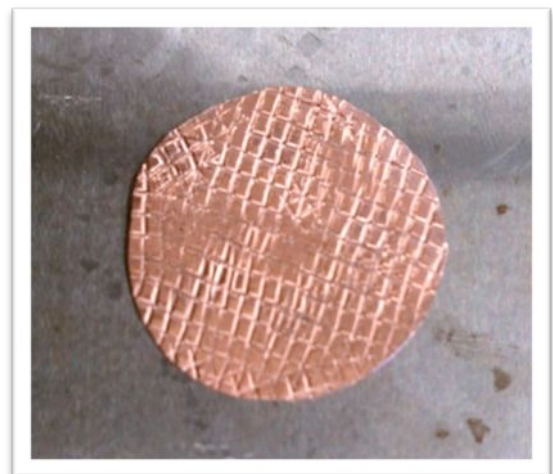


**Step 6.** Place the top metal piece (copper in the example) on the bench block. Place the piece of screen on top of the metal and hammer randomly with the utility/household hammer (NOT the Fretz hammer).



**Step 7.** The screen imparts an interesting texture to the metal.

Screen is available in most hardware stores. Small pieces of repair screen are often pre-packaged. Metal screen is the best. Nylon screen will work, but will not be re-useable.



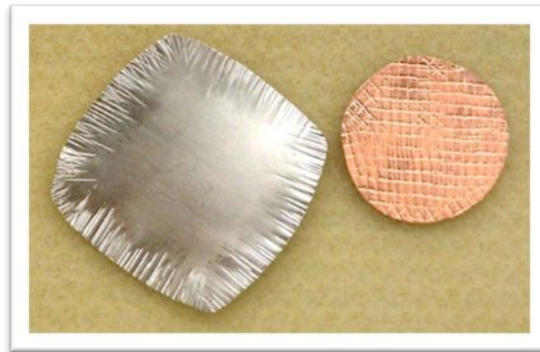


**Step 8.** Place the bottom piece of metal (in this example, silver) on the bench block. Randomly hammer the edge with the Fretz No. 13 Sharp Texture Hammer. If the Fretz hammer is not available, the peen side of the chasing hammer can be substituted.

Cutting and/or hammering metal may cause it to warp. If this occurs, place the metal on the bench block and hammer with a plastic or rawhide mallet. The plastic/rawhide mallet will flatten the metal without marring it or flattening the texture.



**Step 9.** The pieces of metal are now textured and more interesting for use in the jewelry piece.



**Step 10.** Additional interest can be added by using a chemical patina, liver of sulfur, to “age” the metal.

Add a small amount of liver of sulfur (either gel or rocks) to a bowl of warm water. Do this in a well-ventilated area. Liver of sulfur smells like rotten eggs. Avoid getting the liver of sulfur on your skin/hands.

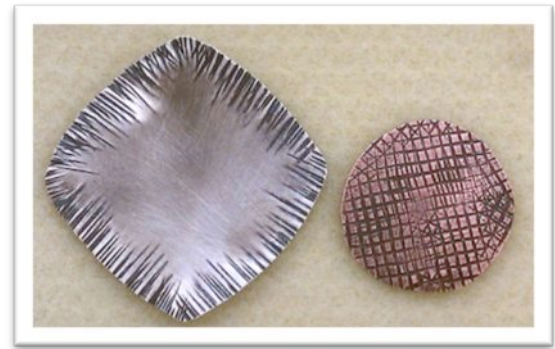
Prepare a second bowl of plain water to serve as a rinsing bowl for the pieces.

Dip each piece individually into the liver of sulfur solution. When the desired level of patina is achieved, remove and rinse in the plain water. A plastic fork is a good tool to use for this process.

Copper and sterling silver react differently to the liver of sulfur. Copper will accept patina much quicker than sterling silver. Because of this difference in reaction time, it is a good idea to patina metals separately whenever possible.



**Step 11.** Using the fine grit sandpaper (greater than 300 grit), polish off some of the patina from the surface of the metal pieces. This process removes the patina from the “high” spots of the texture, while leaving the patina in the “low” spots of the texture. This action highlights the texture. Remove as much or as little of the patina as desired.

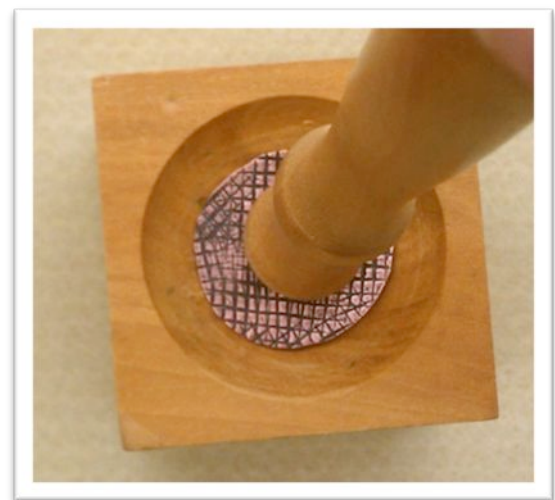


**Step 12.** A wooden dapping block is used to change the shape of the top piece to a bowl-shape. The wooden punch used will not mar the metal or alter the texture.



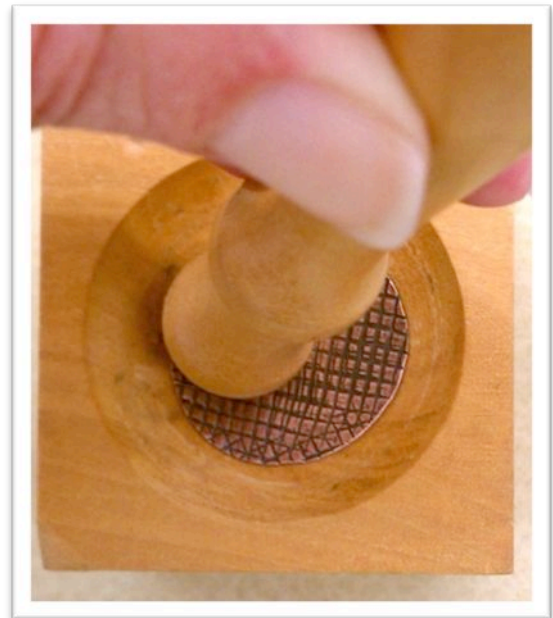
**Step 13.** Place the top (copper) piece in one of the concave areas of the dapping block. Choose a larger, “shallower” area first.

Place the wide, flat wooden punch on the center of the metal piece. Tap the opposite end with the utility/household hammer. The center of the piece will depress slightly to conform to the shape of the dapping block

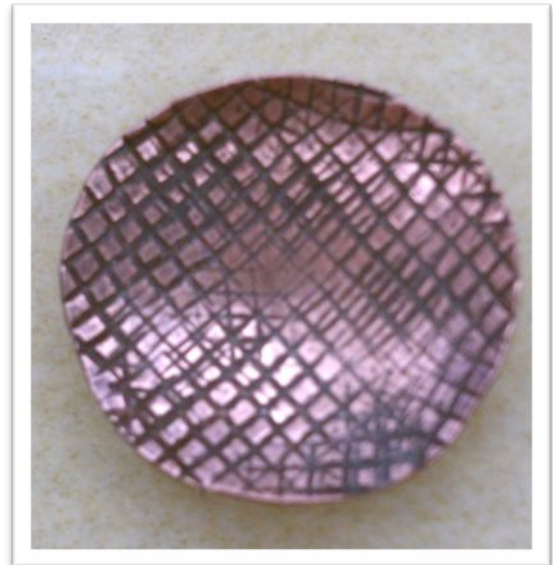


**Step 14.** Move the punch to the outside edge of the piece. Tap the opposite end of the punch with the utility/household hammer to conform to the shape of the dapping block. Continue moving the punch around the edge of the piece and tapping the punch until the entire piece has been shaped.

The piece can be moved to a “deeper” bowl and the shape of the piece continually changed. Continue this process until the desired shape is achieved.



**Step 15.** Copper “bowl” ready for the next step.



**Step 16.** Determine which gauge of fine silver round wire fits snugly through the hole of the bead cap. The wire should fit snugly. The wire should not “wobble” around in the hole.

Occasionally, a bead cap will have a hole that is too large for one wire, but too small for the next larger diameter of wire. In these situations, use the round diamond needle file to enlarge the hole in the bead cap. Twist the diamond file back and forth in the hole until the hole is enlarged just enough to accommodate the larger wire.

**NOTE:** Diamond files work in all directions.





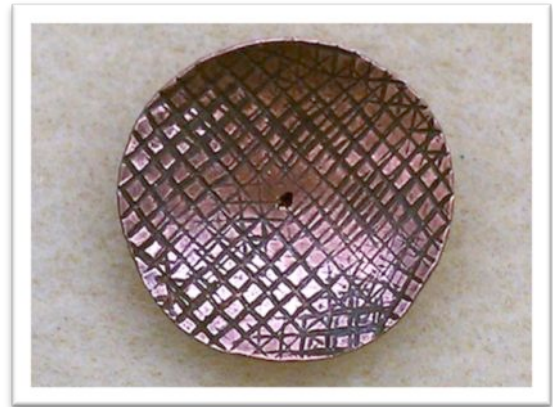
Make a note of which gauge of wire fits through the bead cap. This will be important when it is time to drill holes for the rivet.

Place the bead cap “inside” the bowl. Insert one of the drill bits through the hole in the bead cap and mark the copper bowl. This mark denotes where a hole will be drilled for the center rivet.

**Step 17.** Highlight, with the permanent marker, the mark made with drill bit.

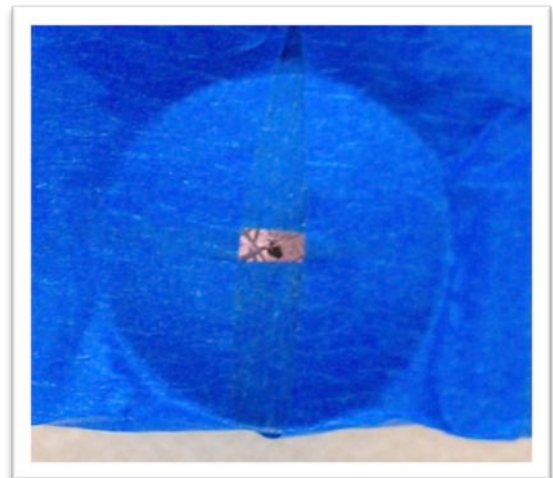
Place the bowl on the bench block. Place the sharp point of the center punch on the mark and tap the opposite end with the utility/household hammer. This will make a small divot in the metal.

The small divot will provide a place to rest the tip of the drill bit when drilling a hole. The divot prevents the drill bit from “skipping” across the surface of the metal



**Step 18.** Securely tape the copper piece to a wooden block using painter’s tape. Painter’s tape will not leave a residue on the metal.

Rest the tip of the drill bit in the small divot and drill the hole in the bottom of the copper bowl.

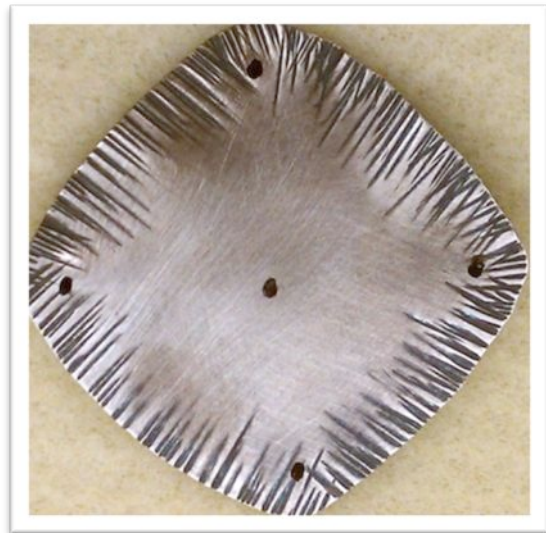


**TECH NOTE:** The diameter of the hole must match the diameter of the rivet wire that will pass through the bead cap. If the bead cap accommodates a 14 gauge wire, use a #52 drill bit in the drill to drill the hole; a #56 drill bit for 16 gauge wire, or a #60 for 18 gauge wire.

**Step 19.** Place the copper bowl on top of the silver metal piece. Adjust the placement of the copper bowl as desired. Mark through the hole in the bottom of the copper bowl to the surface of the silver piece. This will mark the location of the center rivet. The center rivet will pass through the bead cap, the copper bowl and the silver metal piece.

Mark, using the permanent marker, spots for additional decorative rivets. The example has decorative in three corners.

Mark the spot for a bail. The example has the bail located in the fourth corner.



**Step 20.** Place the silver piece on the bench block. Place the sharp tip of the center punch on the center mark. Tap the opposite end of the center punch with the utility/household hammer to create a small divot in the metal. Repeat for all the remaining marks.

Tape the silver piece to a wooden block using painter's tape.

Drill the holes for the rivets (but not the bail) using the drill bit that matches the gauge of wire that fits through the bead cap.



**TECH TIP:** Again, the diameter of the hole must match the diameter of the rivet wire that will pass through the bead cap. If the bead cap accommodates a 14 gauge wire, use a #52 drill bit in the drill to drill the hole; a #56 drill bit for 16 gauge wire, or a #60 for 18 gauge wire.

### Making the Rivets

**Step 21.** To create the ball head rivets, gather the heatproof surface, butane torch, quench bowl of water and cross locking tweezers.

Set up your work area with your quench bowl in front of you on the heat resistant surface. Your torch should be set up such that the flame will be over the quench bowl. Be careful where your flame will point.

Fill torch with butane according to its instructions. Remove the butane from workspace. Light your torch and set it on your heat resistant surface such that the flame is over your quench bowl and is pointed at an angle away from you.



Ball Head Rivets

† Riveting Essentials riveting tools are patent pending

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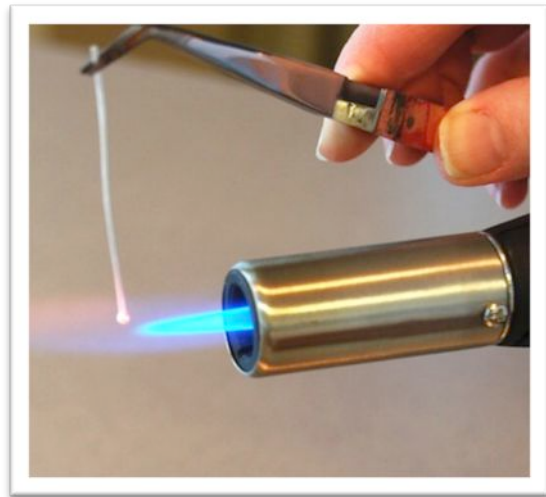


**Step 22.** Cut the correct gauge of fine silver wire into at least four 1½ inch pieces of wire. Remember, the gauge of wire used corresponds to the gauge of wire that fits snugly through the bead cap.

Grasp one end of a wire piece with the cross- locking tweezers. Hold just the very tip of the free end of the wire piece in the flame.

The end of the wire will begin to form a ball. Don't let the ball get too big or it will drop off into the quench bowl. When the ball is the size you desire, take the wire out of the flame. Let it cool until the glow is gone and lower into the quench bowl to cool.

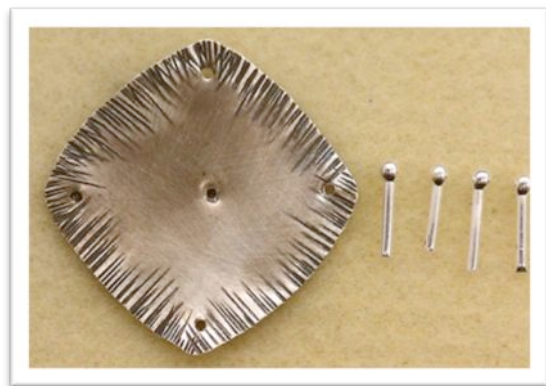
Turn off the torch.



**SAFETY TIP:** ALWAYS wear safety glasses when cutting wire and metal – small pieces of wire or metal can fly into unprotected eyes.

**Step 23.** The silver piece and the ball-head rivets are now ready for the next step.

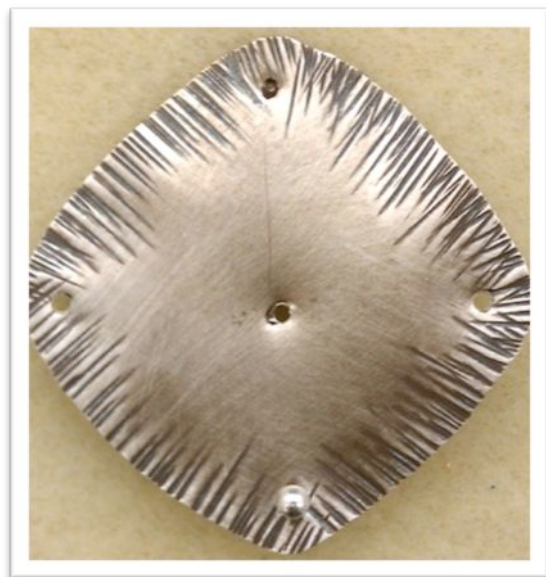
**NOTE:** The ball-head rivets may not be the same length.



### Riveting the Pendant

**Step 24.** Place one of the ball-head rivets through one of the corner rivet holes in the silver piece. The ball should be on the front of the piece, with the “tail” extending through the metal to the back.

If any of the rivet holes are too small, use the round diamond file to enlarge the holes until the wire just fits through the hole. The wire needs to fit snugly in all the holes through which it passes.



**Step 25.** The tiny dapping block will be used to set the ball-head rivets



**Step 26.** Invert the piece and place the ball-head in one of the small cavities of the tiny dapping block. Use the smallest cavity that accommodates the head of the rivet. This will help stabilize the piece. There should be a small amount of space between the top of the dapping block and the face of the piece. This will prevent any marring of the piece when the rivet is set.

Hold the piece firmly so the ball-head rivet does not wobble. It is helpful to place a finger on either side of the rivet to stabilize it.



**Step 27.** Place the corresponding Riveting Essentials Rivet Gauge† over the tail of the rivet and hold the assemblage of pieces in place, stabilizing the pieces with two fingers.



**TECH TIP:** Riveting Essentials Rivet Gauges† come in pairs and are marked with the wire gauge to which they correspond. Only one of the pair is used with ball-head rivets. Rivet Gauges stamped with a 14 are to be used with 14 gauge rivet wire, those stamped with 16 are to be used with 16 gauge rivet wire and those stamped with 18 are to be used with 18 gauge wire.

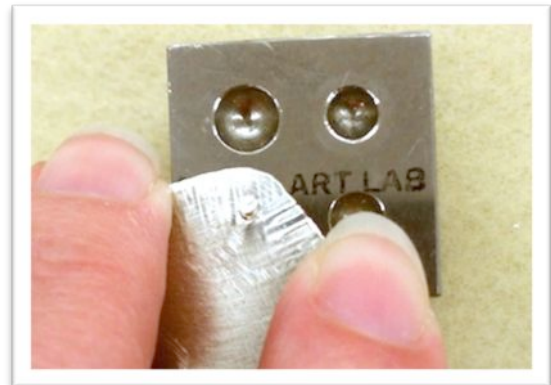
**Step 28.** With the back of the flush cutters firmly against the Riveting Essentials Rivet Gauge† cut the tail of the rivet wire.

Control the cut tail of rivet.



**SAFETY TIP:** ALWAYS wear safety glasses when cutting wire and metal—small pieces of wire or metal can fly into unprotected eyes.

**Step 29.** Remove the Riveting Essentials Rivet Gauge† exposing a short stub of rivet wire.



**Step 30.** Using the peen side of the chasing hammer, gently tap on the exposed stub of rivet wire until it begins to spread and flatten.

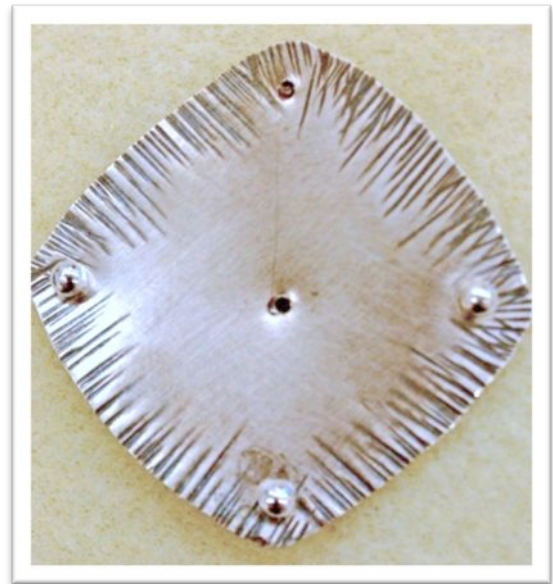
Continue tapping until the stub is completely flattened. It will resemble a tiny mushroom cap.





**Step 31.** The corner rivets are completed first. They have a lower profile than the center assembly. When planning the order of rivets to complete, the lower profile rivets are completed first.

Complete the remaining corner rivets.

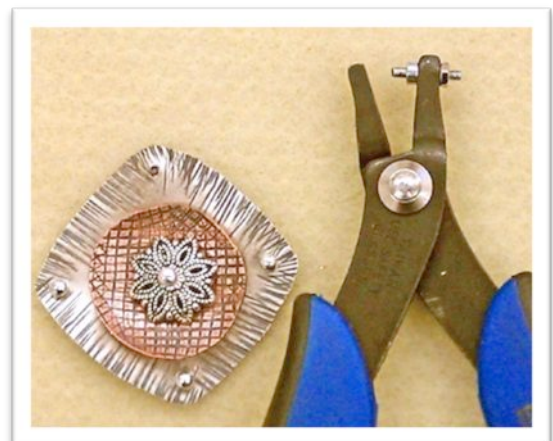


**Step 32.** To complete the center rivet, pass the tail of one of the ball-head rivets through the bead cap, the copper bowl and then the silver metal piece.

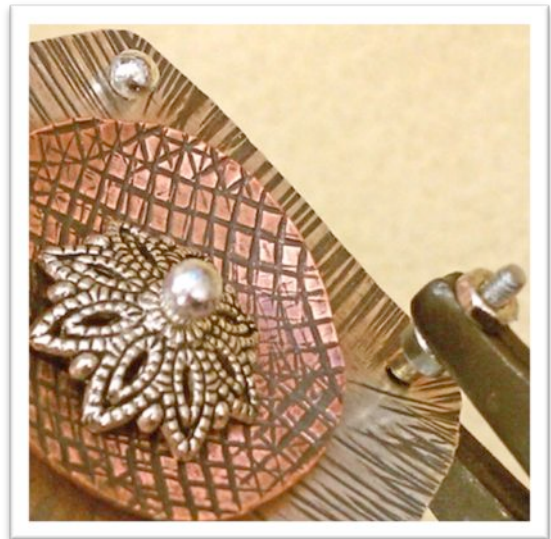
Invert the assembly and place the ball-head in one of the small cavities of the tiny dapping block. There should be a small amount of space between the top of the dapping block and the face of the piece. This will prevent any marring of the piece when the rivet is set.



**Step 33.** Hole-punching pliers are used to make a hole in the piece to accommodate a bail.



**Step 34.** Place the punch of the hole-punching pliers on the remaining mark on the silver piece. Gently squeeze the handles of the pliers. The punch will “pop” through the metal, making a hole for the bail.



#### Attaching a Jump Ring Bail

**Step 35.** A large jump ring will serve as the bail.

To open the jump ring, grasp one side of the jump ring with the Wubbers Classic Medium Flat Nose Pliers and grasp the other side with the Wubbers Classic Chain Nose Pliers. The opening of the jump ring should be between the two pliers.



**Step 36.** Twist the pliers away from each other to open the jump ring like a gate.



**Step 37.** Thread the jump ring through the hole in the silver piece. Grasp the jump ring as before and close the jump ring like a gate, reversing the process outlined above.

The piece is ready to wear.

Try pairing this piece with the Sliding Knot Leather Cord class on Wubbers University!



### Review Questions

- 1) How many Riveting Essentials Rivet Gauges<sup>†</sup> are used to set a ball-head rivet?
  - a) none
  - b) one
  - c) two
- 2) What determines the diameter of the rivet holes drilled?
  - a) The gauge of the wire that fits snugly through the bead cap
  - b) The gauge of the sheet metal
  - c) The number of pieces being joined
- 3) What determines the gauge of rivet wire used?
  - a) The gauge of the wire that fits snugly through the bead cap
  - b) The gauge of the sheet metal
  - c) The number of pieces being joined
- 4) What tool was used to form the copper piece into a “bowl” shape?
  - a) Plastic mallet
  - b) Flat nose plier
  - c) Dapping block
- 5) What tool is used to enlarge rivet holes?
  - a) Round diamond needle file
  - b) Drill bit
  - c) Wubbers Classic Chain Nose Pliers