A Guide to

Foam and Black Tray Mounts

MOA

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This manual discusses the foam and matboard mounting system used by the UBC Museum of Anthropology. These mounts are used for both the display storage of the museum's collections.

There are several reasons for using this mounting system. The first is earthquake mitigation. The foam mounts are designed to hold the objects protectively in place in the event of an earthquake. Similarly, they are used with objects installed in drawers as a stabilizing measure against drawer bounce and slamming. The mounts also serve as handling trays, enabling staff and researchers to move and study the objects with a minimum amount of contact. Damaged or deteriorating objects can benefit from the system as well, as the mounts can be designed to support weakened areas and help slow further deterioration or slumping. The mounts are also useful in keeping elements of a multi-part object together in one place.

High density foam (Plastizote) is an excellent material to use for mounting, as it is relatively fast and easy to use, takes few special tools, and the necessary methods can be quickly learned. It is important to use high density foam, as the mount pieces shoulder a portion of the object's weight, and may need to retain their shape and hold for many years

This manual outlines some techniques for specific items, such as rattles and hats, and discusses other general mounting methods that can be adapted for many types of objects.

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Tools Required

Product	Supplier	Contact
Matboard: 100% rag acid free paper board in 4-ply and 8-ply	Larson Juhl	1-800-387-9381
Metal Edge	Metal Edge International	215-699-8755
Plastizote Foam: LD45 in widths ¼ inch, ½", 1", 2", 4"	Norsman Allfoam	604-888-9155
Coroplast: corrugated polyethylene/polypropylene sheet	GE Polymershapes	604-468-2112
Twill tape: sizes ¼", $^{1}/_{8}$", 100% cotton	Cansew	604-682-4341
Double-sided tape	Woolfitts	1-800-490-3567
Tyvek	Material Concepts	materialconcepts.com
Hot melt Archival glue	University Products	604-431-1930
Panel cutter (Fletcher 3000)	Accent Art	604-247-1771
Profile gauge	See CCI Note 18/3	
Wire cutters	Hardware store	
Hammer	Hardware store	
Cutting mat	Art or fabric supply store	
Hollow punches (Boehm, JLB330CM))	Tool store	
Olfa knife and blades	Hardware store	
Scroll saw	Tool store	
Band saw	Tool store	
Heat shrink tubing	Electrical supply store	
Copper wire	Hardware store	
Hammering block (machined steel block measuring at least 1 ½" thick)	Metal supply store, jewelers supply store	
Scalpel and #11 blades	Fisher Scientific	
Tweezers	Fisher Scientific	
Bamboo skewers	Hardware store	
Ruler, metre stick	Art or drafting supply store	

Making a Black Tray

Consider your object:

- Look for any broken or damaged areas
- Weight- is the object top heavy? Is one side heavier and may need to be supported? Will its weight cause a standard 4 ply matboard tray to bow?
- How many pieces need to be trayed together?
- How is object to be displayed? Upright or laying flat?
- How does it sit? Does it have a rounded bottom, or is it sturdy?

Measuring

- Measure the object's total length and width, not just the base. The tray should contain the dimensions of the entire object for safety and balance.
- Remember that the mount may add to the dimensions.
- Add ½" to 1" to both the length and the width. This will create a protective foam border around the object.

Tray depth

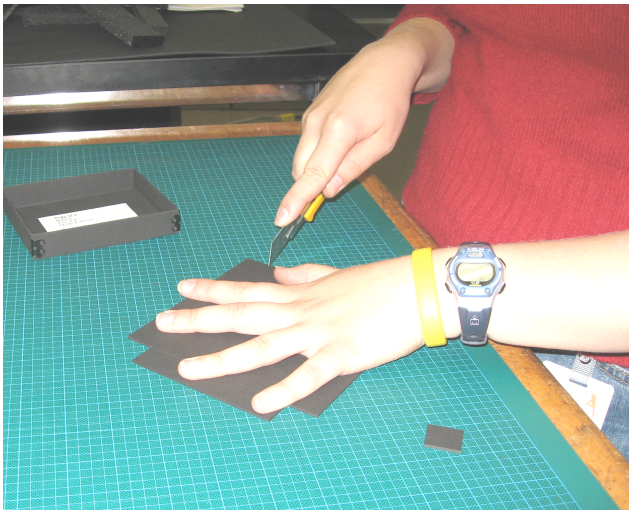
Standard tray depths are ¾" and 1 ¼", though ¾" is most commonly used.
A 1 ¼" tray is used if an object is heavy or tall and needs to be sunk to a deeper degree, or if it is particularly high and would look awkward in a shallower tray.

Add the chosen tray depth to the length and width measurements when calculating the size of matboard to cut.

E.g.) Length (or Width) + ½"(foam border) + 1 ½" (combined tray wall measurement for 2 parallel sides of a ¾ depth tray)= _____

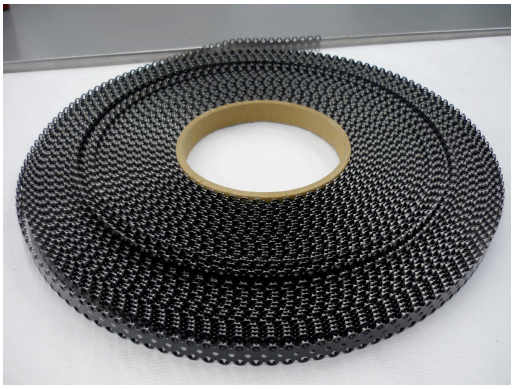
Cutting

- Use a mat cutter to cut your tray.
- To make the walls of the tray, score ¾" in from the edge of each side.
- Squares will be created in each corner by the scoring. Cut them away.



Assembly

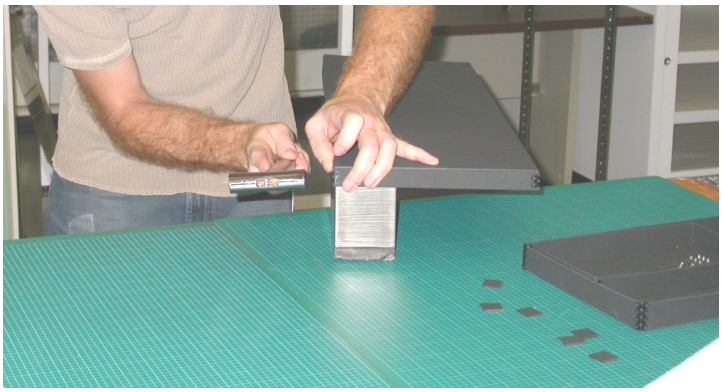
- Attach 2-hole metal edge on one side of each corner.



A roll of metal edge

2 and 4-hole metal edge

- Fold the sides of the walls up, along each score. Use the hammering block to help shape the corner.
- Wrap the metal edge around the corner and firmly hammer it in.



Foam

- Line the tray with ½" foam for a ¾" walled tray, or 1" foam for a 1 ¼" wall. Cut it to fit snugly in the tray, with no gaping at the sides.

Mounting the Objects

Foam of various thicknesses can be used to make many kinds of secure mounts. The thickness chosen depends on the size of the object, its weight, and the level of support needed.

Sinking

This is an easy and secure way to mount a variety of objects. It is used mainly for flat-bottomed figures, tools, coins, panels, stiff leather aprons and gloves, matted works on paper, and many other types of objects. The goal is to pressure-fit the object into the cutout, making a tight fit.

Use a tray with ¾" walls and a half inch foam insert for objects that are light, or have a low profile.

Use a 1 ¼ inch tray with a 1" foam insert for objects that are tall, top heavy, have a thick base, or need a greater depth of foam for the majority of the base edge to come into contact with the inside wall of the cutout.

Centre the object on the foam in a prepared tray. Use a skewer to trace the base and other parts of the object that come into contact with the foam. Cut this shape out with a scalpel or a scroll saw.

If the object sinks too deeply into the cutout, the cutout's discarded foam piece can be cut in half horizontally and replaced in the cutout under the object, raising it. The edge of the cutout can be beveled with a scalpel to show more of the object's base, or to clean up a messy cut.

Sink with a beveled edge

Harpoon with attached rope that is coiled and sunk

Leather gloves sunk into 1” foam

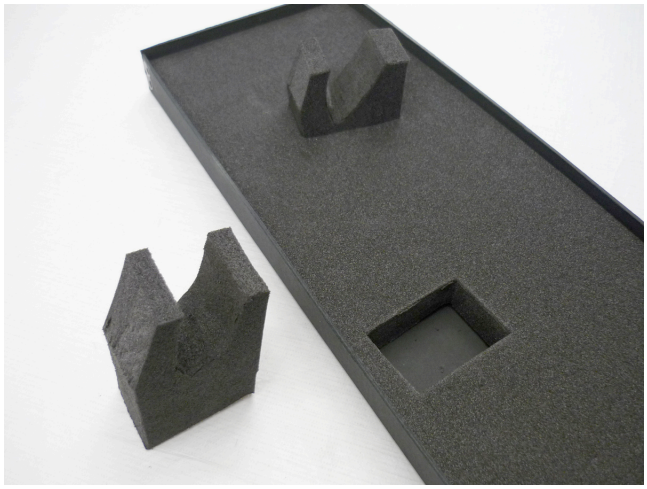
Sinking can securely hold necklaces with moveable parts

Round objects can be pressure fit into a sink. Shown is a combo mount with a sink and a U mount

3D Mounts
These mounts use a custom fit foam piece, usually cut from 1" foam, to hold items slightly up off the tray for better viewing than a sink mount. They can be used for many different types of objects, from knives to replica boats, and are a good solution for long objects such as pipes and sticks.

With a profile gauge, take a measurement for 2 or 3 spots along the base of the object. The longer the object, the more mounts required to keep it steady. Trace these measurements onto 1" foam (½" foam can be used for small, light objects), and cut the mounts out with a scroll saw. If the item is at all tall or leans to the side, like the object in the picture above, the mounts will also need to be tall in order to hold the object in place. Low profile items can have a lower mount, as they don't need as much support.

Place the object into the mounts and transfer onto a tray prepared with a foam liner (use ½" or 1"; a ¼" liner will not work for this mount). Once a good placement is decided on, trace around each mount with a skewer, and cut that out. Sink the mounts into the holes. Adhesive shouldn't be necessary, as the foam liner will hold the mounts in place.

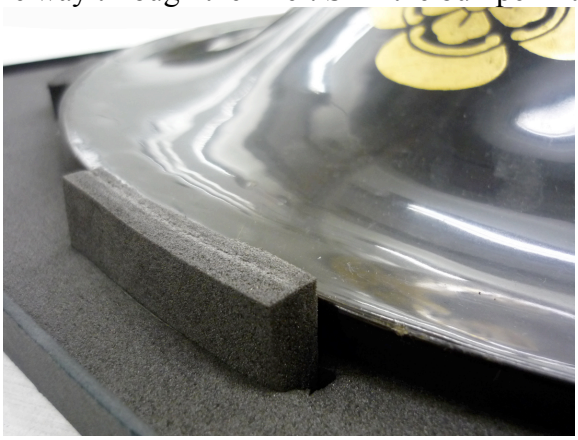


Bumpers
Bumpers are rectangles cut from ¼" foam and inserted into a foam liner no thinner than ½". They can be used for light objects that have a flat bottom, such as shoes, or have edges that make

regular contact with the foam. They are useful for light containment and where minimal contact between object and foam is necessary, due to paint flaking or other forms of deterioration.

It is important to remember that bumpers do not give good mounting support. They are only useful to hold the object in place on the tray.

Set the object on a prepared tray. Choose several locations along the base that come into full contact with the foam liner for bumper placement. The bumpers should be spaced evenly to give support from all sides. Decide on the length and height needed for the bumper (anything higher than one inch from the surface of the liner becomes wobbly), remembering to compensate for the part that will be sunk into the liner. Place it snugly beside the object, trace its shape on the foam liner, and cut the hole all the way through the liner. Sink the bumper into this hole.



Tie Downs

A tie down mount is used for clothing, belts, shoes, dolls, grass skirts, and other items that shift easily, are made of a soft material, or have too much movement for a foam mount. Tie downs are also used in situations where a very firm hold on the object is needed, such as installation into a drawer.

A carvings that is too round for a pressure fit is secured using a tie down

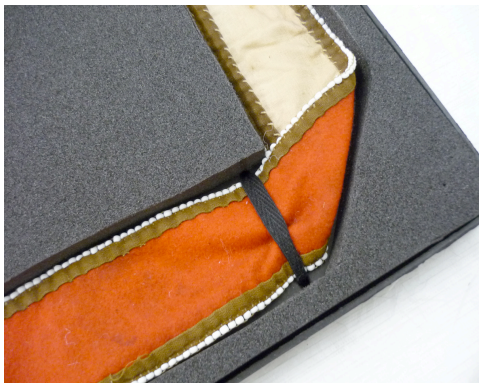
A tie down consists of a black tray with a ¼" foam insert, a matboard liner, and twill tape. A hollow punch of a ¼" diameter is also needed.

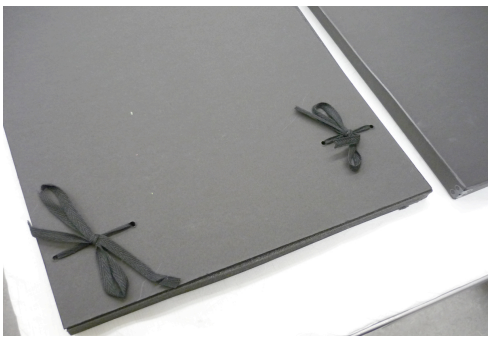
Cut the matboard liner to the same size as the bottom of the tray. It will be placed between the tray and the foam insert. Its purpose is to prevent the twill from cutting through the foam.

Decide where to place the twill on the object. It can often be hidden under the skirts of a doll, the tongue flap of a shoe, or in the sleeves of a garment. Wear can occur if twill rubs on fur, delicate basketry, joints that have been glued, or on other unfit areas.

Once twill placement has been decided, use the hollow punch to make holes in the foam and the matboard liner, and insert the appropriate length of twill. The twill is tied underneath the matboard liner, where the knot will not be seen.

A fabric bag secured with tie downs





Twill is tied on the back of the matboard insert

A rope secured with tie downs

Flat, Folded Objects

When a flat object requires folding, it is important not to create a sharp crease when doing so. This is especially important for objects made of leather or grass fibres or for beaded objects strung on a natural thread. To round out the fold, a piece of foam can be carved to support the object or a small piece of thin foam can be bent and the ends sewn together to have the same effect. For very small objects with very shallow folds, the hollow punches can be used to make thin cylinders of foam to support the material.

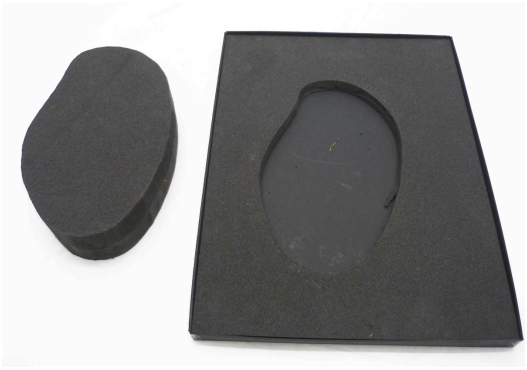
Hill mounts

Hill mounts consist of a thicker piece of foam (1”, 2” or 4”) sunk into the thinner foam tray insert, creating a raised “hill” to support open objects like necklaces, neck rings, and bracelets. It can also act as a kind of hospital mount, in that it helps objects to keep their shape.

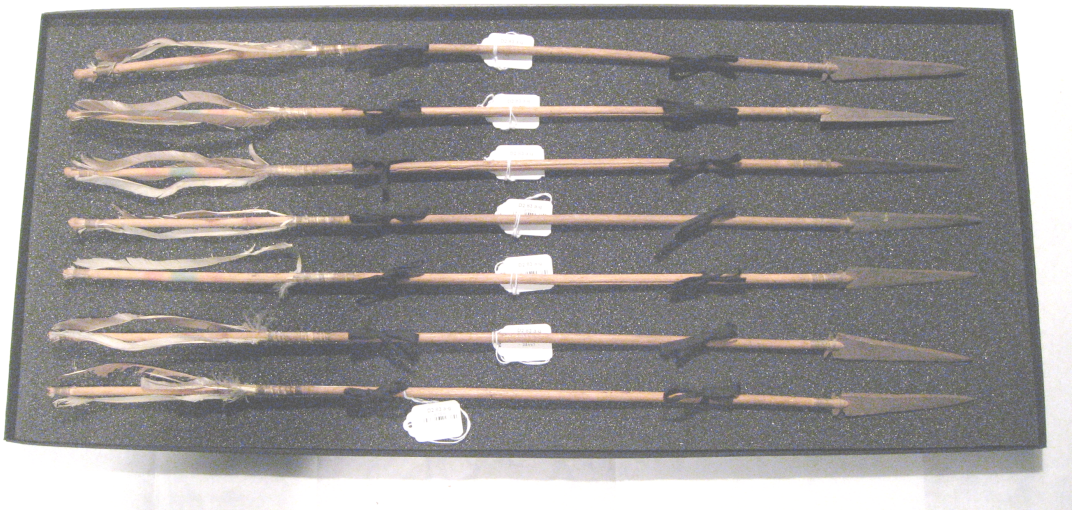
Hill mount for a bracelet

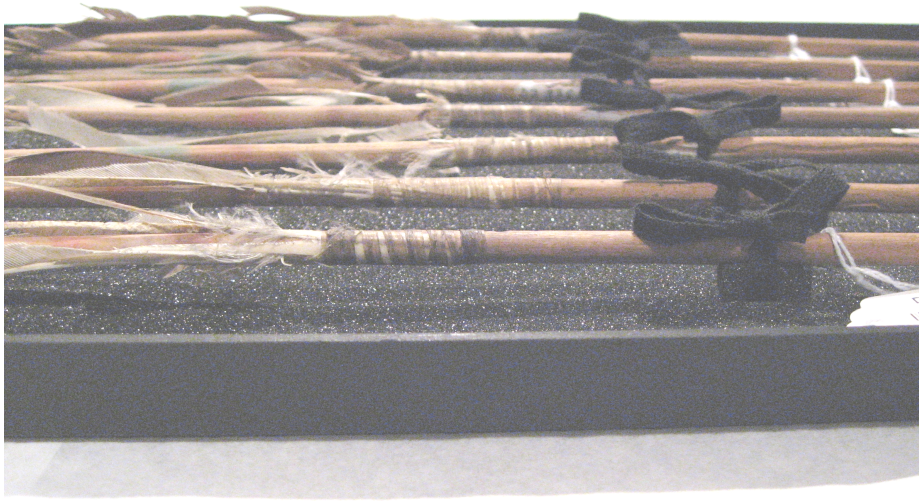
Hill-type mount for a necklace

Choose an appropriate thickness of foam for the mount, considering that it will be partially sunk into the foam tray insert. Place the object on the foam and trace around the *inside* edge, keeping the object at a somewhat tight extension. Cut this piece out, and place it onto the prepared tray. Trace around the base of the mount onto the foam insert and cut this piece away. The mount should now sink tightly into the insert, without bowing it. Place the object onto the mount. The fit should be sufficiently firm to keep the object in place.



Arrows and Objects Requiring Slight Elevation:
Quills should be slightly raised with a small block of foam so that slight elevation is given to objects with components that would otherwise be damaged. The shafts of the arrows can be tied down to the foam using twill tape or immobilized using matboard tabs.





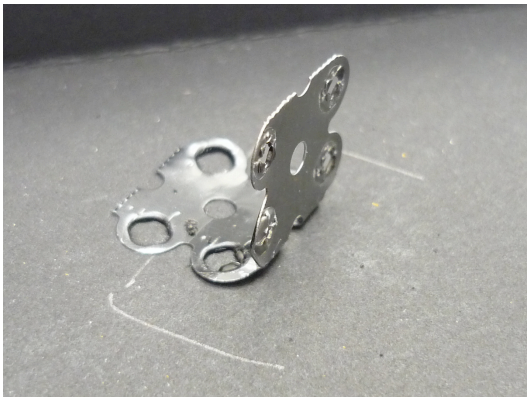
Basket Mount

Upright foam pieces are custom fit to the base of the basket using a profile gauge, and can be scaled to support the smallest to the largest type of woven or birch bark baskets. Metal edge can be used to attach the pieces to the tray bottom. A foam liner is not necessary.

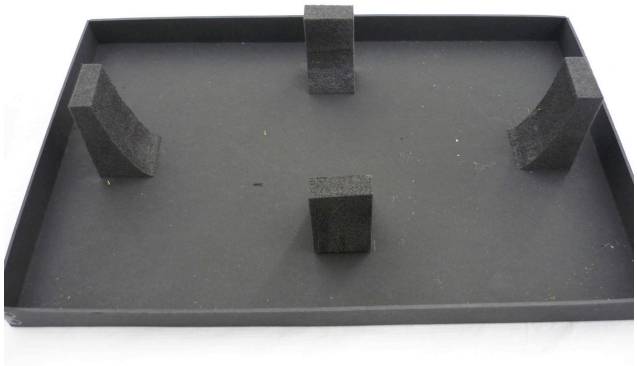
Use the profile gauge to measure each dimension, at the middle, of the bottom edge of the basket. Trace these measurements onto ½" or 1" foam depending on the size of the basket. Cut the pieces out using a scroll saw. You should have four basket pieces - one for each side.

Prepare the metal edge. Take a piece of 4-hole metal edge, and hammer the tines flat on one half of the piece. This side will be inserted into the foam mount. The other side will be hammered onto the tray.

Centre the basket on the prepared tray. Place the mount pieces in their places, snug to the basket, and trace around each one. Attach a piece of the prepared 4-hole metal edge to the centre of each tracing.



Fold the flattened side up to a 90 degree angle. Line up the foam basket piece with the tracing and press its bottom onto the metal edge to make an indentation. Use a scalpel to cut a slit, and insert the metal edge into this slit.



The basket mount should hold the basket firmly as the bottom makes full contact with the tray. If the basket is lifting off the tray, the mount is too tight and one or more of the pieces need to be moved back a bit.

Round-Bottomed Object Mounts

There are 2 kinds of mounts that can be used for round-bottomed objects such as bowls, pots and containers.

Foam Ring

Set the pot on 2" foam. Rest your tracing skewer vertically against the widest part of the pot and trace a circle around the object. Cut this shape out with a band saw.

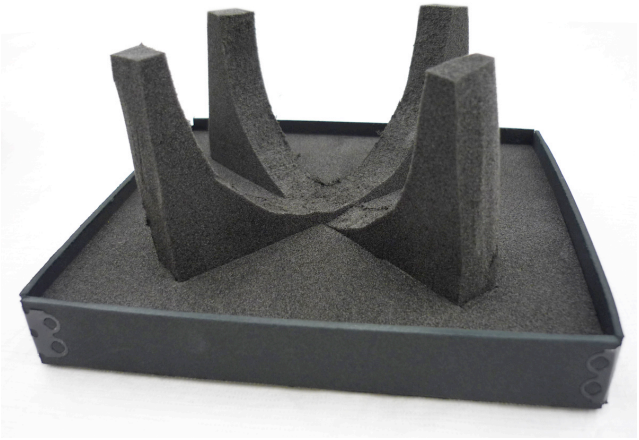
Cut an interior circle out of this piece at the same angle as the pot's base using a sharp Olfa knife. You want the pot to just barely make contact with the table while sitting in the ring, but let the ring completely support the weight. If the pot doesn't touch the table while sitting in the ring, you can slice thin layers off the bottom of the ring until it does.

Cross U-Mounts

This mount works for round-bottomed objects that need a studier support than the foam ring, due to installation in a drawer, for example. It consists of a matboard tray with a foam insert, and 2 U-shaped mount pieces.

Use a profile gauge to take the shape of the object's bottom on 2 perpendicular lines. Have this U shape come up to the mid-point of the object's sides, as seen above. Trace these shapes on foam- ½" width for smaller objects, 1" for large. Remember to add ½" or 1" to the bottom of the U as the pieces will be sunk into the foam insert.

Cut one of these U-shapes in half and trim either ¼" or ½" off the bottom length of each piece, depending on the width of foam you are using. Set the 2 pieces perpendicular to the uncut piece. They should make an X.



Place the mount in this configuration on the prepared tray and trace around the pieces. Cut this shape out of the foam insert, and sink the mount pieces into the cutout. The object should not bounce around in the mount when shaken. If it does, you may need to make the arms of the U-shapes higher, or closer fitting.

Plate and Flat Bottomed Bowl Mounts
These mounts are used to hold plates and shallow bowls, and as a component in spoon mounts. Hooks are cut out of 4-ply matboard and attached with metal edge to a tray bottom to hold an object in place. The tray does not require a foam insert.

Matboard Hook

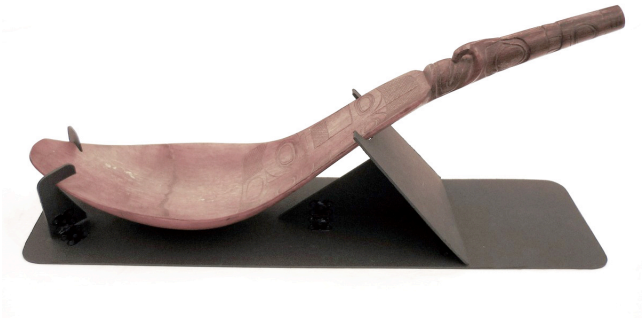
Measure the height of the object from base to lip at each point where a hook will be placed. 4 hooks are usually required. Cut the hooks' height to these measurements. Centre the object in the tray and place hooks firmly against the object at each chosen point. The flat of the hook should be resting on the lip of the object while the hook's base is in full contact with the tray. Trace the hook's base on the tray where it will be attached.

Hammer a piece of 4-hole metal-edge onto the bottom of the hook on both sides. Hammer the hooks to the tray. You should be able to slide the object into place under the hooks.

A ¼ inch foam insert can be used with these trays to cover the metal edge, or if the hooks have ended up being too high for the object and you want to raise it a little. Cut a piece of quarter inch foam to fit the tray. Hold the foam over the tray, trying to line it up as closely as possible with the walls. Press the foam gently down onto the hooks so that they leave an imprint on the foam. Cut those imprints out with a scalpel. Push the insert down over the hooks to the base. Trim in place as needed.

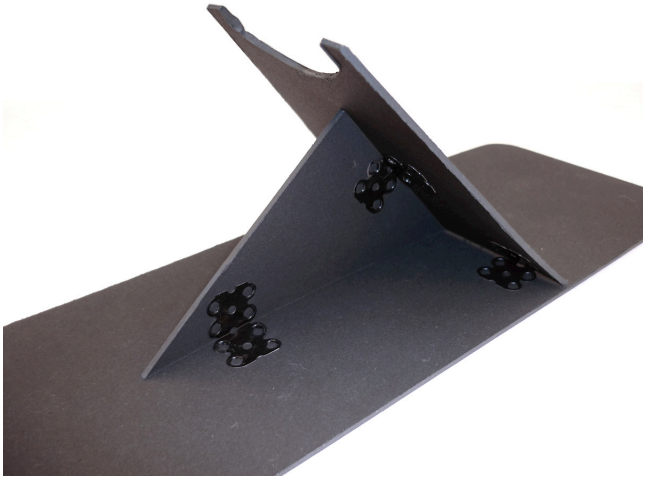
Spoon Mount
Spoon mounts have primarily been used in mounting NWC spoons. They use both matboard hooks and matboard support mounts to hold the spoon upright and in place, and can be scaled in size to support most styles and sizes of spoons and ladles.

The spoon can be mounted on an unwalled matboard tray.



Hold the spoon at the angle at which it is to be displayed. Measure the length and width and add a half-inch to each dimension. Cut a piece of matboard to this size. Round each corner with a corner rounder.

Again holding the spoon at the desired angle, measure the height at the handle's halfway point. Use this measurement to determine the height of the matboard support piece. The support piece will be angled slightly forward, so add a half-inch or so (depending on spoon size and angle) to the measurement.

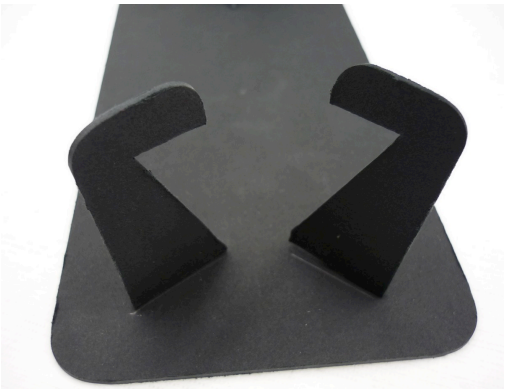


Shown is the groove at the top of the support piece, resting on the anchor piece

The matboard support piece should be as wide as the tray.
Make a triangular matboard anchor for the support piece, using its angle to determine the anchor's shape.

Using 4-hole metal-edge, attach the anchor to the middle of the matboard support piece, ensuring the base of each piece firmly meets the tray.

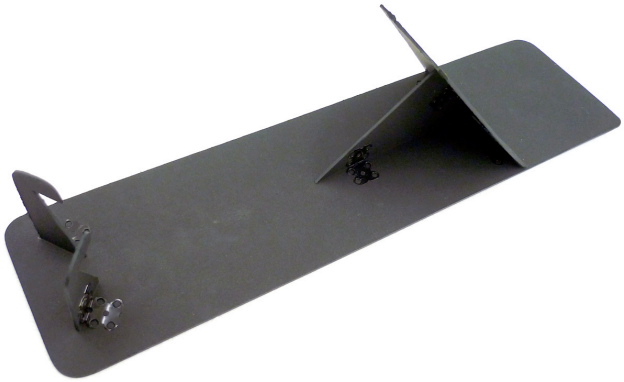
2 matboard hooks (see diagram for matboard hooks in the plate mount section above) are used in a spoon mount. They are positioned at the front of the spoon's bowl, far enough apart that the spoon won't slip out of the mount when tipped or shaken.



Balancing the spoon on the support piece, measure the bowl from table to lip at the 2 points where the hooks will be placed. Cut the hooks to this height. Snugly place the hooks in place against the spoon and mark their position with a pencil.

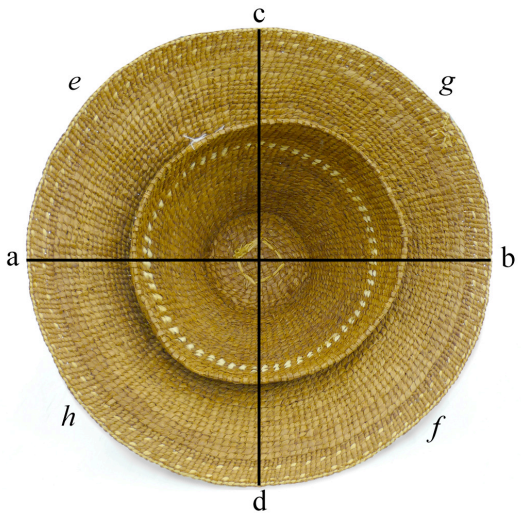
Attach 4-hole metal-edge to each side of the hook base. Hammer hooks onto tray.
Attach 4-hole metal-edge to the support piece- 2 at rear, and one on each side of the anchor, where it will connect to the tray. Hammer support piece to the tray.

Rest spoon handle in groove on support piece, and slip bowl under the hooks. The flat of the hooks should make contact with the spoon lip. The spoon should not move when tray is shaken.



Hat Mount
These mounts are most often used to mount woven hats, but can be used for fabric hats as well. Foam spines support the hat from the inside. Depending on the size of the hat, ½" or 1" foam can be used for the spines. Hot glue is used to attach the spines to the tray base. A foam insert is not required.

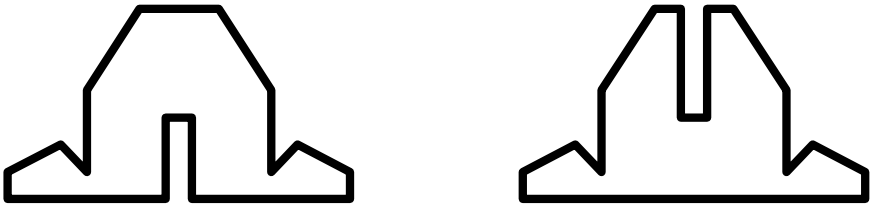
With a long fingered profile gauge, take 2 cross section measurements of the interior of the hat. See a-b and c-d in the photo below.



Interior of hat

Trace these onto foam and cut out using a scroll saw. Test the fit by inserting each into the hat. They should make as much contact as possible with the interior of the hat, and be supportive, but not stretch the hat.

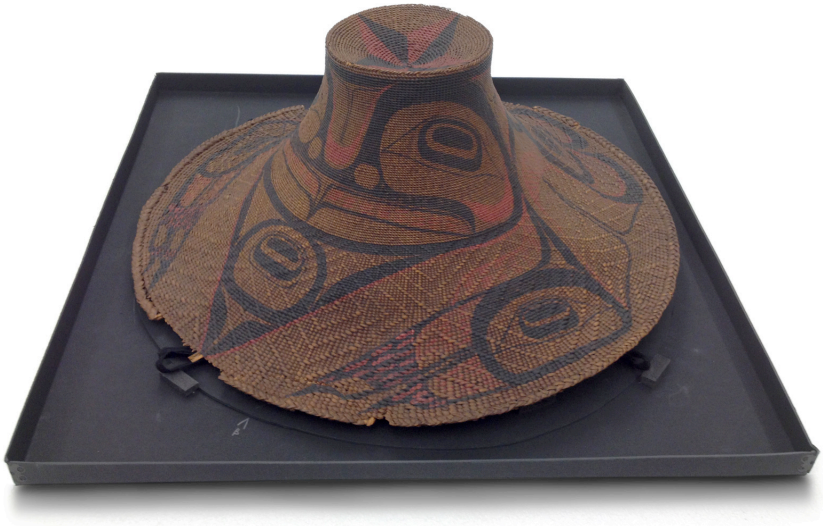
Join the two pieces by removing a portion from the centre section of each and fitting them together.



If the hat is in good condition, only 4 spines are necessary. If it is starting to slump or the weave is loose, 8 spines should be used.

An 8-spine hat mount

To make the 4 extra spines, take measurements e-f and g-h (in the photo above) with the profile gauge and cut these out of foam. You will need to cut these pieces in half and tailor them to fit into the remaining spaces between the original spine structure. Cut the rear of each extra spine at an angle so that it can be inserted completely between the existing spines. Glue the spine bottoms to a matboard circular base, and to each other at the meeting points if desired. The base can then be placed in a matboard tray and fixed into position with foam bumpers.



Bowl Rattle Mounts

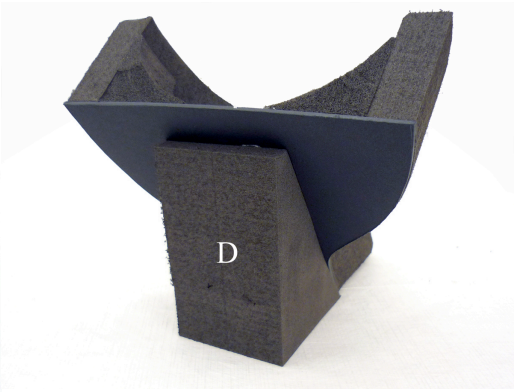
These mounts are comprised of a 1 ¼" depth tray with a 1" foam insert, 2" foam support and mount pieces, and a 4 ply matboard backing.

Lay the rattle on a piece of paper, and trace its shape, from the mid-point of the bowl, down to the end of the handle, plus an extra inch (which will be cut off later at the appropriate angle).

Part A: Trace the shapes onto a piece of 2" thick foam, and cut those out with a band saw.

Part B: Cut a long piece to support the handle out of 1" foam. It will be inserted between the lower arms of the Part A pieces.

Place the rattle, fitted into foam pieces A and B, onto a piece of 4 ply matboard. Trace around this, and cut the shape out of the matboard. Glue the foam pieces onto this backing, making sure that the rattle fits snugly between them.



Part C: Cut small supports from 1" foam to match the angle of the rattle's bowl, and glue them to the top of the matboard backing, beside parts A. This helps cushion the rattle and keep it in place.

Part D: Cut a foam support out of the 2" foam. Its front should be cut at the angle you want the rattle to sit at.

Cut the bottom of Part A to the same angle as Part D.

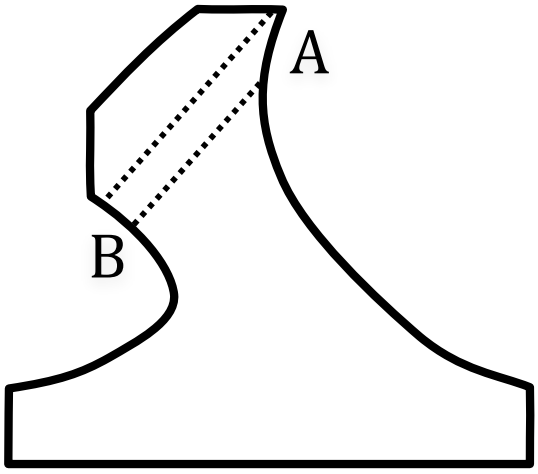
Glue Part D to the centre back of Part A, ensuring that both pieces make good contact with the table and with each other.

Centre this piece onto the prepared tray and trace around the bottom. Cut the shape out, and sink the rattle piece into it. You may need to cut out a small half circle in the foam insert where the rattle's handle should sink into the foam.

Raven Rattle Mounts

These mounts are designed to hold a raven rattle upright, allow it to be turned, and still hold it securely. They are made up of a 1 ¼" depth tray, 1" foam insert, and a 2" foam support piece. A 3" long hollow punch, slightly smaller than the diameter of the rattle's handle, is required.

Adapt the diagram below to fit the rattle's handle. This piece is designed to show as much of the bottom of the handle as possible, and for the base of the bowl to make contact with the foam. Trace the modified diagram onto 2" foam and cut out with a band saw.



With the hollow punch, cut a hole through the middle of the upright portion, starting at point A and angling down to point B. The rattle's handle should not touch the foam base when inserted.

Place the mount onto the prepared tray and trace around the base. Cut this out, and insert the mount into the hole. It should hold firmly and the rattle should not tip. Glue the mount to the tray base if necessary.

Basket Hospital Mount

This mount can be used to stabilize a basket that is slumping or losing its shape and tightness. It uses scored and shaped matboard to contain the basket.

Build a tray to the necessary dimensions. A foam liner is not needed.

Measure the basket's circumference. Cut two pieces of matboard, each 1/3 of the circumference measurement. The height of these pieces will depend on where the basket is slumping and needs support.

Either by hand or with a mat cutter, score these pieces from top to bottom (see picture below). The scores should be a half inch apart for larger baskets, and a quarter inch for smaller. These scores will allow you to shape the matboard piece to the basket for a secure fit. Round the top two corners of the piece with a corner rounder.

Place the basket in the tray and shape the scored matboard pieces to the ends of the basket. The matboard supports are usually placed at opposite ends of the basket and wrap around onto the sides to hold it in place on the tray. The basket should be held snugly, but not so tight that damage will be done when inserting and removing the basket from the mount. Mark where the supports are to be attached on the tray.

Attach at least 3 pieces of 4-hole metal-edge to the outer side of each support piece- one in the centre, and one on each of the very outer corners. The support piece should be held firmly in place.

If desired, you can line the support pieces with quarter inch foam to further protect the basket.

White Tray Hospital Mount
The purpose of this mount is to safely contain, damaged and deteriorating objects, such as basketry pieces, without using a pressure fit. White or black matboard can be used for the tray, as well as a white foam insert, and a Tyvek lining. White foam and Tyvek are used in order to more easily determine if deterioration is continuing.

A tray with 1 ¼" walls and 1" white foam is standard for these mounts. When measuring the piece to make the tray, add at least 1 inch to each dimension. This is to ensure there is enough space for the lining cuts in the foam.

Place the object on the foam and loosely trace around it with a skewer. Keep in mind that room must be left between the cutout and the tray wall for the Tyvek lining cut.

Remove the shape you have traced from the foam. Around the outside of the cutout, make a cut a half inch deep. Lay a piece of Tyvek over the cutout and tuck its edges into the cut, all the way around the shape.

As you go, smooth the Tyvek into the cutout and have it make even contact with the floor of the tray. If there is excess Tyvek, either cut it away or tuck it into the cut.

Disproportionately Heavy Objects:
Clubs, such as the ones pictured below, and other objects that are heavier at one end, pose a challenge for the safe handling of black trays. One solution is to balance the weight by placing two similar objects in the same tray with the heavy ends opposite each other. If the tray is unbalanced a sign indicating to the handler that one end is heavier than the other will also suffice. Trays for heavier objects should either be made from or reinforced with 8 ply mat board.

Label example:

CAUTION

HEAVY AT THIS END

Objects such as the clubs below can have their heads embedded slightly in the foam, and their shafts can be immobilized using tie downs.

Drawer Installation

The technique discussed below demonstrates the installation of objects into a pull-out exhibit drawer. Due to the innate slamming, shaking and vibrations that may occur in such an enclosure the objects' trays must be sunk into a high density foam liner to prevent as much movement as possible.

Supplies Needed:

For template:

large piece of paper and marker; or masking tape

For drawer:

Product	**Supplier**	**Contact**
Foam sheet- Plastizote LD45, ½" thick	Norseman Allfoam	604-888-9155, www.norseman.ca
Olfa knife	Hardware store	
Sharpened wooden skewer	Grocery store	
Ruler or straight-edge	Opus Framing (or any art supply store	1-800-663-6953
Scalpel	Fisher Scientific	www.fishersci.ca
Measuring tape	Hardware store	
Sewing pins	Dressew (or any department store)	Dressew (Vancouver) 604- 682-6196

Important Note: Objects should be mounted in display trays before the installation planning begins.

Template

- Make a template of the exact dimensions of the drawer on paper, or tape out the dimensions on a flat surface. This template allows object placement experimentation without marking up the foam pane that will hold the object trays in place.

- Place objects into the desired configuration, making sure to leave at least a half inch between each tray and between the trays and the sides of the drawer. Take into consideration the placement of any labels, text panels or other elements that will also be installed in the drawer.

Cutting In

- Cut a piece of foam, ½" thickness, to the drawer's exact size. Plastizote LD45 is a good choice for foam as its density will hold the boxes firmly in place.

- Arrange objects onto the foam according to how they were laid out in the template, making sure everything is straight and perfectly placed.

- Trace lightly around each box with a skewer or other sharp object to mark the foam. If needed, sewing pins can be placed around the boxes to hold them in place during the tracing process.

- Set objects aside. With a scalpel, cut out the rectangles you have traced on the foam. It is important to make very precise cuts to ensure that the foam holds the objects securely in place in the drawer.

Installing

- Once the holes for the trays are cut, install the foam template into the drawer and fit the trays into their places.

Note: It's normal for trays not to fit perfectly at this stage as the drawer walls may compress the foam. With a sharp scalpel, very slightly widen holes that require it until the trays fit snugly, without the surrounding foam liner bubbling up.

- In the drawer used as an example for this chapter, paper labels accompany each object. They have been installed by making a deep cut in the foam with a scalpel and inserting the bottom half inch of the label into the cut.