Manual for the

Handling of Museum Artifacts in Jordan

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MRAMP

مشروع متحف مادبا الإقليمي الأثري الجديد

This manual, funded by USAID SCHEP, originated as a companion resource to the Madaba Regional Archaeological Museum Project (MRAMP) Artifact Handling Training Workshop that occurred on the 14th and 15th of September 2020. The workshop trained individuals in proper artifact handling, packing, transportation, and storage. This manual is applicable to artifact handling throughout Jordan. The workshop was initiated and coordinated, and the manual edited, by MRAMP co-directors, Douglas Clark and Suzanne Richard.

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Part I: Artifact Handling Principles

One of the participants during the workshop (Image courtesy of SCHEP).

i. Artifact Handling Stewards

Artifacts are an important aspect of our cultural heritage and caring for them is an incredible honor and responsibility. Caring for artifacts is the responsibility of all who work in and around museum collections, including collection managers, registrars, conservators, curators, museum technicians, archivists, archives technicians, interpreters, maintenance personnel, and researchers. The collection manager, curators, and conservators work together to ensure the preservation of a collection.

Training in the museum during the workshop (Image courtesy of SCHEP).

Proper collection management contributes to a preventive conservation plan. Preventive conservation is defined as any measure that prevents damage or reduces the potential for it. In practical terms, the handling, storage, and management of collections (including emergency planning) are critical elements in a preventive conservation methodology. To aid in this effort, it is essential that individuals who will be working with cultural heritage materials are properly trained to do so.

To that extent, this manual is provided to those entrusted with caring for artifacts in Jordan. This manual serves as a quick reference to those wanting to learn about proper artifact handling, packing, and transportation.

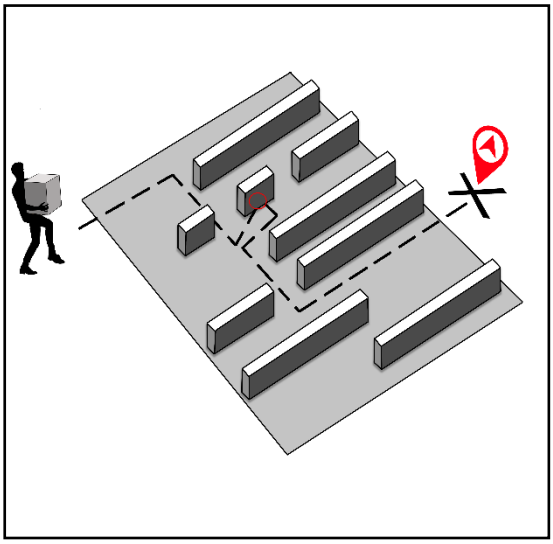
ii. Preparing to Handle Artifacts

Handling artifacts refers to touching, changing the position, or moving the artifacts even over a short distance. Handling artifacts should be done with extreme caution and care. Before handling artifacts, one should ask themselves a series of preliminary questions:

1. *Do I need to handle this?*

- Handling artifacts should always be kept to a minimum as far as possible.
- Only move when necessary.
- All handling incurs risk.

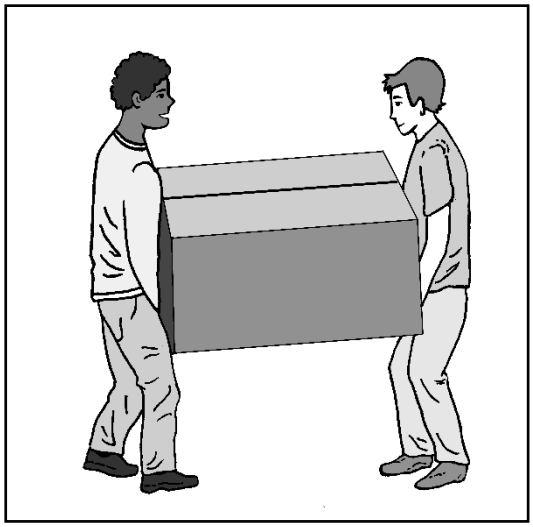
2. *Have I planned a route, and is the path clear? Is the final destination prepared?*



- Plan the route of transportation BEFORE handling and transporting the artifacts.
- Make sure this route is clear and remove unnecessary obstacles in the way.
- Check the width of doors, corridors, and the height of steps.
- Ensure that the path is a quick, direct, and safe route.
- Have the final destination of the artifact cleared and ready in advance.

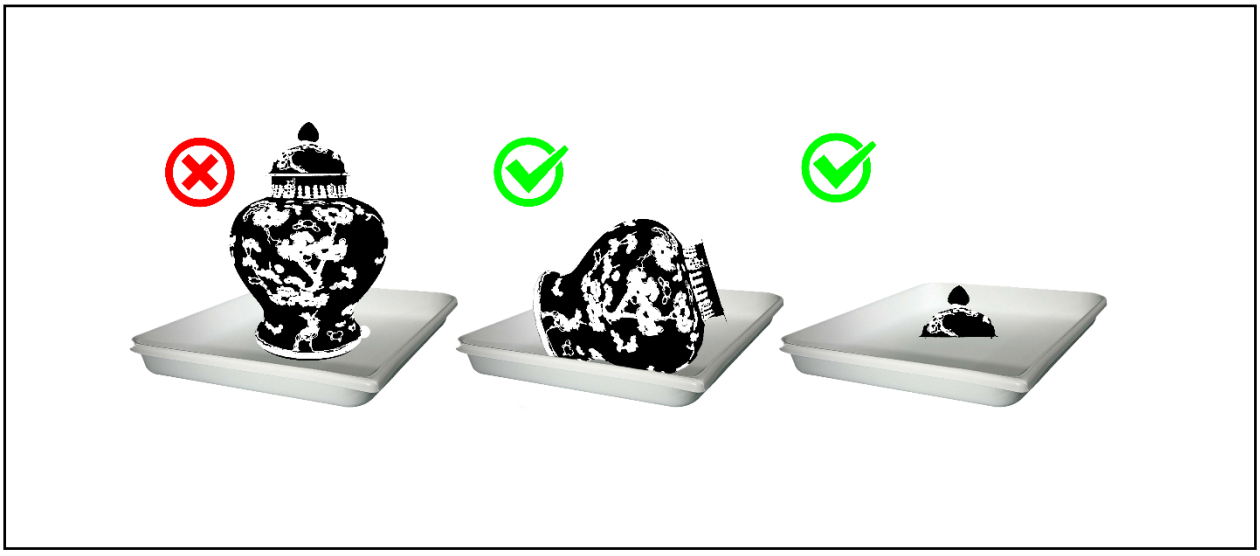
3. *Do I need help to move this object?*

- Ask a colleague for help if the artifact is too large, heavy, or unusually shaped to handle alone.
- Consider if you need a cart or tray to make handling easier.
- Inform co-workers nearby when you are moving artifacts to prevent accidents.



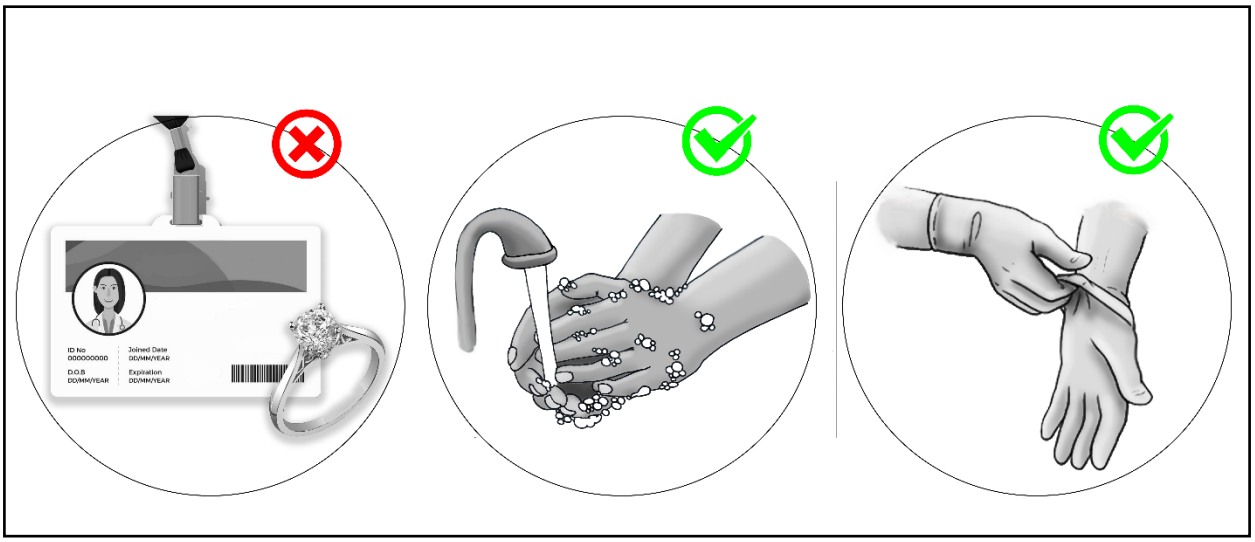
4. *What is the safest way to move this artifact?*

- Always think about all the ways you can move the object more safely.
- To move a vessel and its lid, you would not handle this artifact as one object. This is dangerous as the vessel and lid can damage each other while the object is being moved. Additionally, the lid is at risk of falling off.
- It is best to remove the lid from the vessel and carry each element separately.



5. *Am I prepared to handle the artifact?*

- Wear comfortable clothes and comfortable shoes when handling artifacts.
- Remove any hanging jewelry, badges, and sharp objects such as rings or watches.
- Make sure that any scarf or hair is tied back so that it does not touch the artifact accidently.
- Wash your hands thoroughly.
- Wear appropriate gloves.



iii. Assessing an Artifact

To handle an artifact, a careful assessment first must be considered to decide the best method to handle it. A good way to do this is to ask a series of questions concerning the artifacts:

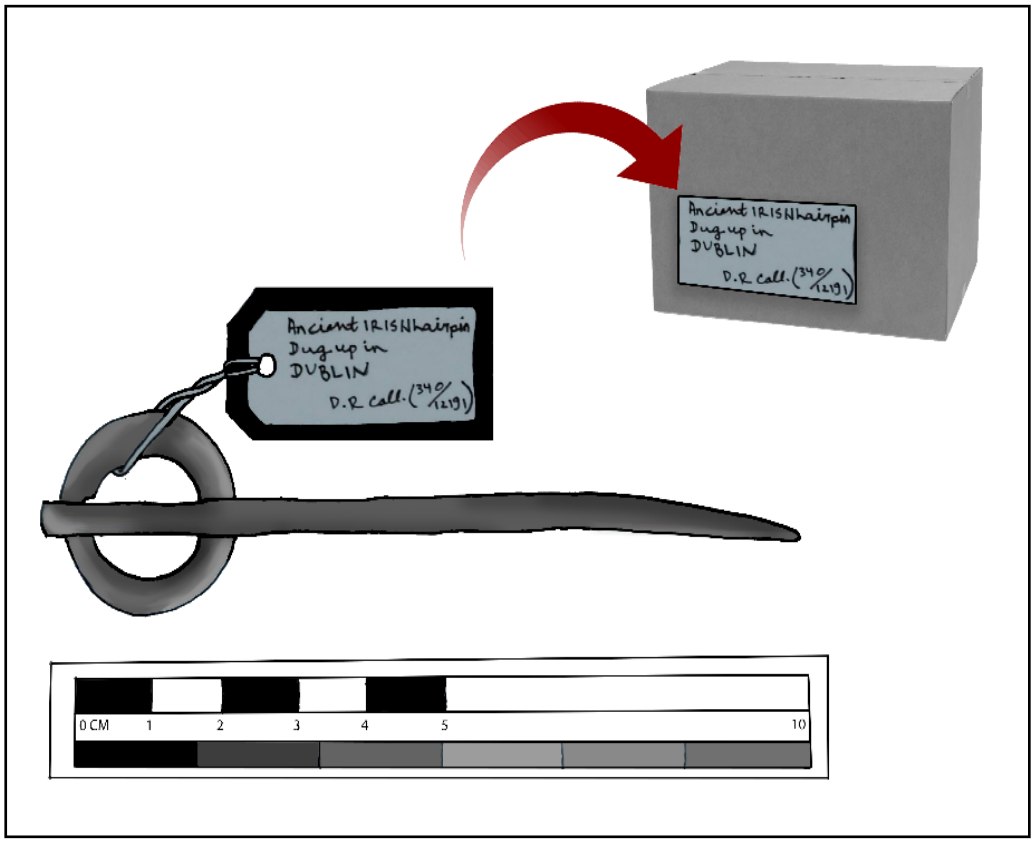
1. *Is the artifact safe and stable enough to handle?*

- An Artifact that is falling apart, has broken or flaking areas, or has a very powdery and crumbly surface should be handled with all its parts.
- Metal artifacts with sensitive corrosion should be handled with caution.

1) www.fieldmuseum.org/sites/default/files/desalination_of_southern_andes_archaeological_ceramics.pdf
2) http://cameo.mfa.org/wiki/Bronze_disease

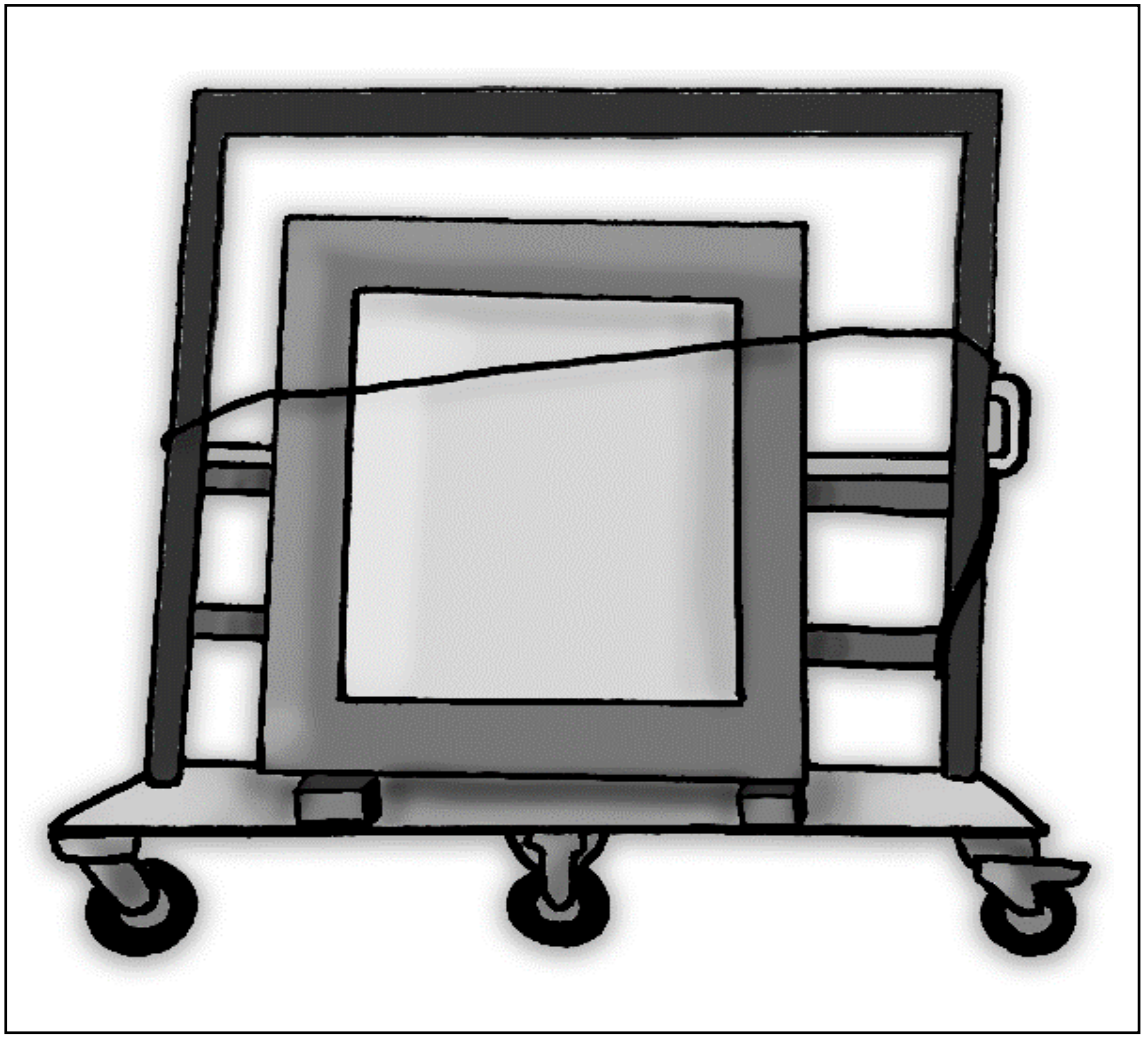
2. *Is everything labeled and organized?*

- Before handling an artifact, make sure that everything is organized and labeled.
- If you are separating parts from the same artifact, make sure that all the parts have a label.
- If the artifact is in a box, check that the box is labeled too.
- Make sure nothing gets lost or confused once the artifact is picked up.



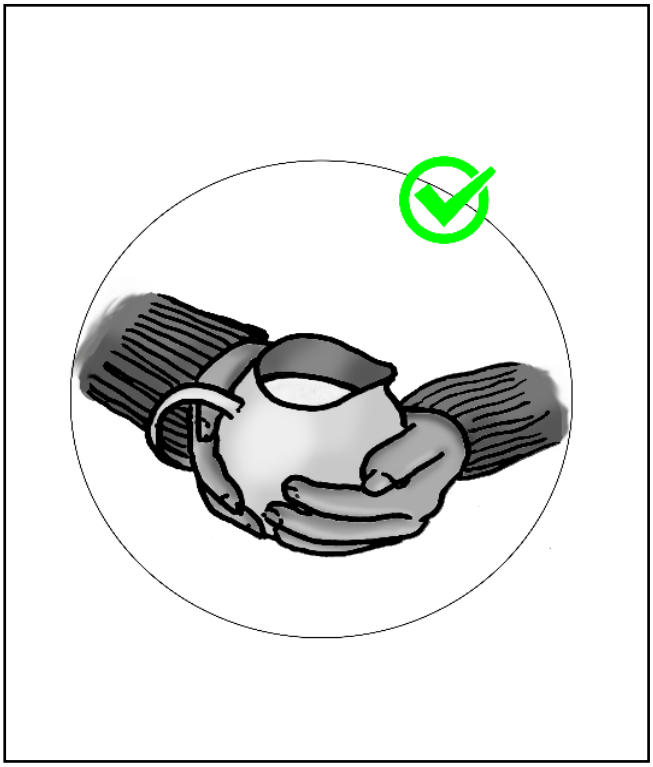
3. *Will I need support or extra equipment to handle this artifact?*

- Handling a very large or heavy artifact or an artifact with an awkward or irregular shape requires appropriate support.
- A trolley/cart or a tray could be used to move the artifact.
- Make sure to provide some sandbags or cushions like tissue paper, if needed to support the artifact, before handling an artifact.



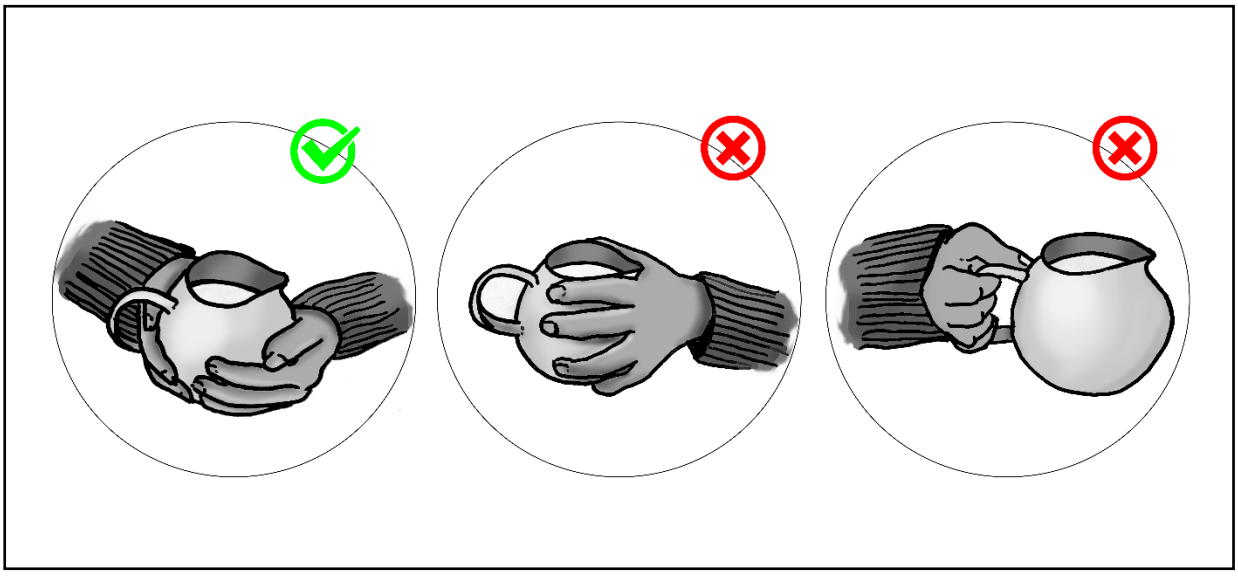
4. *What is the best way to handle this artifact?*

- Before beginning to handle an artifact, make sure to have a handling plan.
- All materials and equipment should be prepared before any artifact is moved.
- Examine artifacts for structural soundness and stability before handling them.
- Generally, both hands should be used in holding an artifact. An artifact is best to be supported by one hand at the base and another hand in the area near its center of gravity.
- Pick up artifacts using as little pressure from the fingers as possible.
- Only handle one artifact at a time.
- It is recommended to use a support to handle artifacts when necessary.
- Good staff training can minimize risks related to improper use.



5. *Does the artifact have any sensitive areas touching it should be avoided?*

- The best way to determine how to handle an artifact is to assess its most weak and most stable areas.
- Avoid handling an artifact by its weak areas. Weak areas include rims, handles, extensions, and repair seams.
- Rims are generally thin-walled areas that are highly susceptible to breaking. Handles and anything extending from an artifact are also weak areas that are at risk of breaking.
- Handling artifacts by previous repair seams should also be avoided. Previous repairs are sensitive areas that can either be very strong or very weak. In either case, avoid holding the artifact by the repaired areas.
- For personal safety, check if the artifact has any sharp areas that might cause any injury and avoid touching these areas.
- Any questionable corrosion or something that does not look like it belongs to the artifact should be checked, as some artifacts can have dangerous elements that are hazardous to humans.
- Extra protection (wearing a coat or a mask) might be needed before handling artifacts.
- If there is anything questionable on the artifacts, a supervisor or an expert should be informed.



Part II: Types of Artifacts

Archaeological Artifacts in Madaba Museum (Photo by F. Marii)

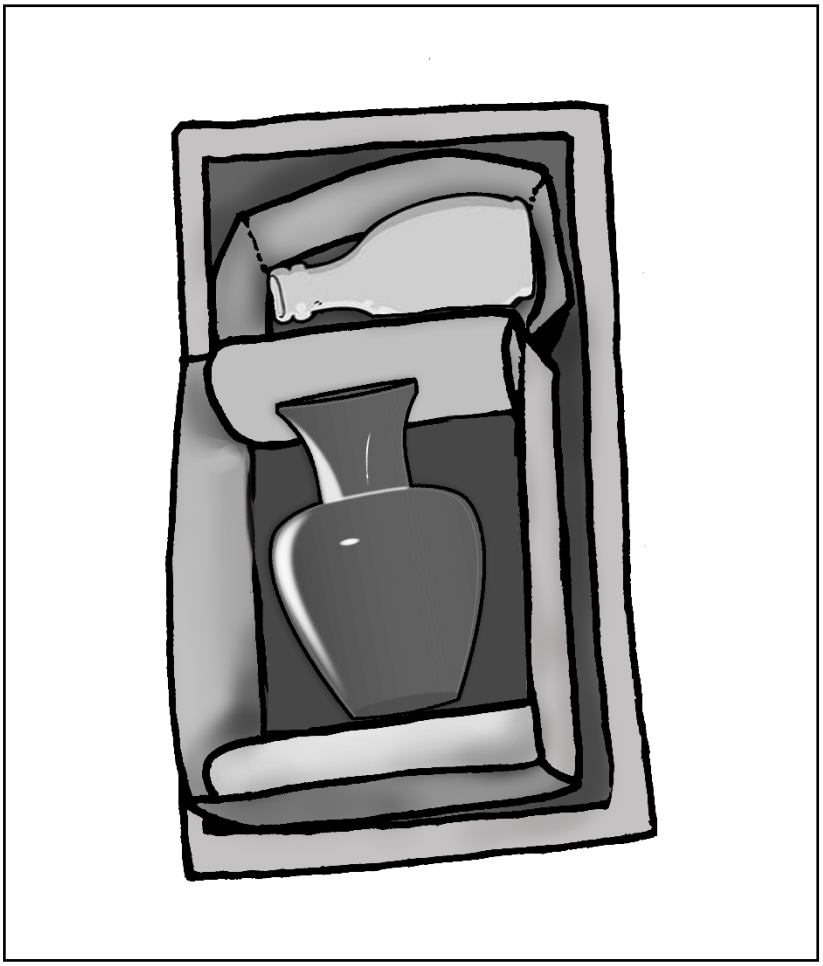
Part II covers the handling of specific museum artifacts. The basic instructions for handling all museum artifacts are similar, but for some artifacts there are extra considerations that should be made. The following section will discuss the handling of artifacts based on the material, the size, and the condition.

i. By Materials

Museum artifacts can be made from different materials. The following section concentrates on materials that specifically require special care during handling.

1- Ceramic and Glass Vessels:

- Check vessels for weaknesses and cracks before handling.
- Mishandling can cause glass to shatter as it is very easy to break.
- Vessels should not be picked up by their handles or necks.
- Individual fragile vessels should be packed separately with appropriate support and padding.
- Make sure broken or loose pieces are kept with the original artifact.



2- *Metal Alloy Artifacts:*

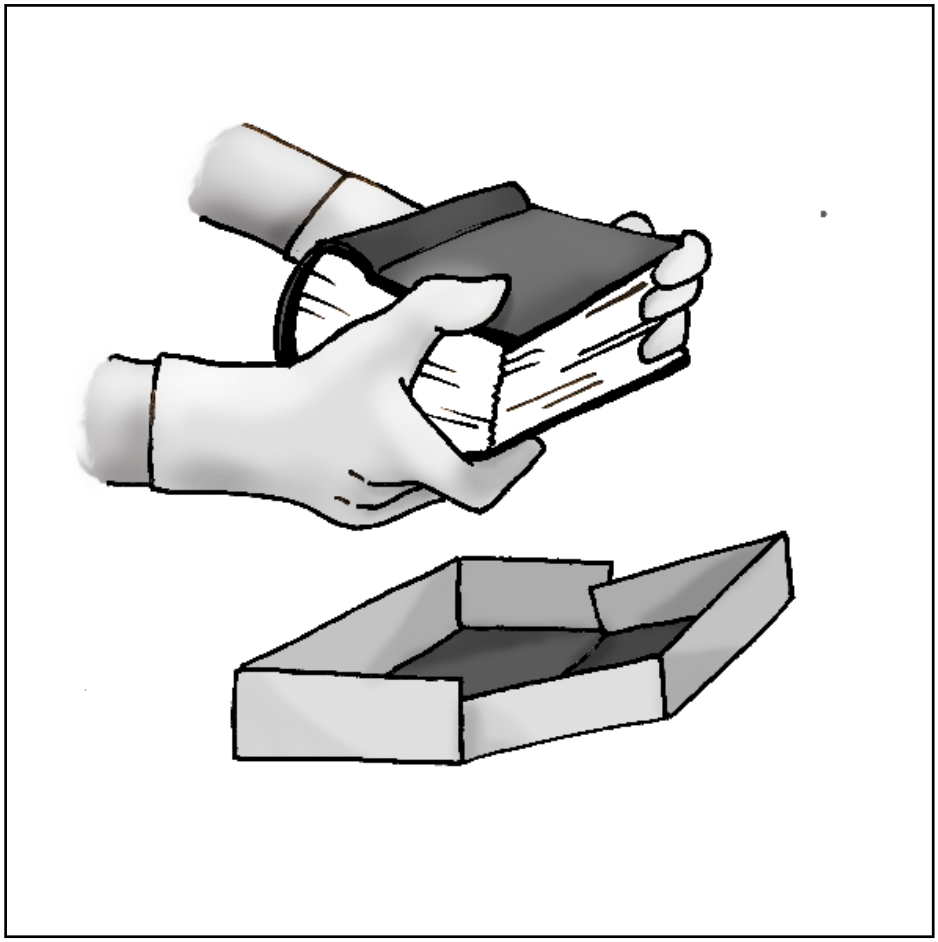
- Metal artifacts can corrode after being handled without gloves, as fingerprints and sweat contain salts, oil, and moisture that corrode the surface. Therefore, most metal artifacts should not be handled with bare hands.
- Make sure not to remove corrosion or closely adhering deposits as these may be holding the artifact together or may contain useful information.
- Dry silica-gel in a bag should be placed in an air-tight container with the metal artifacts. Make sure that silica-gel is not in direct contact with the metals.
- Lead alloy artifacts are sensitive to vapors emitted by organic materials like wood and oil-based paint. Lead artifacts should, therefore, be packed in polyethylene boxes or bags.

3- Organic Artifacts:

- Wash and dry hands before and after handling artifacts made from organic materials.
- Before handling wood, leather, bone, ivory, shell, and textile artifacts, they should be padded or supported within their polyethylene bags or boxes with appropriate acid-free tissue cushioning.
- Fragile wood, leather, and textile artifacts should be supported for handling.
- Avoid folding large flat textiles, as they should be kept as flat as possible or rolled up during handling and transporting.
- Always support flat textiles from below with a rigid support that is slightly larger than the textile.
- Only acid-free paper or an unbleached sheet should be in direct contact with textile artifacts.
- Never pick up textiles by the edges, but rather carry them fully supported by both arms.

4- Manuscripts:

- Always wear cotton gloves when handling manuscripts.
- Handle manuscripts in both hands and from both sides.
- Always handle a manuscript on a table or with a backing support (tray) underneath it.
- For light manuscripts (one page), always provide a rigid support on top of and beneath the manuscript. Place a piece of mat board on top of it to prevent air-currents from lifting the manuscript while being moved.

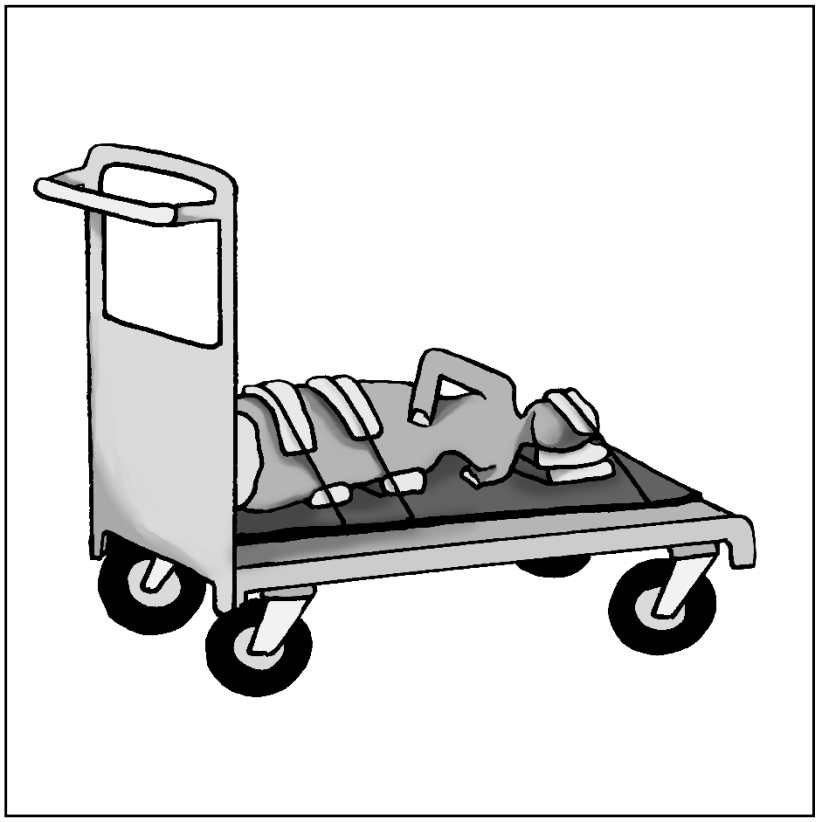


ii. By Size

The size of the artifacts is one of the major factors that control the procedures for handling, transporting, and packing the museum artifacts. The large/heavy and the small/tiny artifacts require special attention.

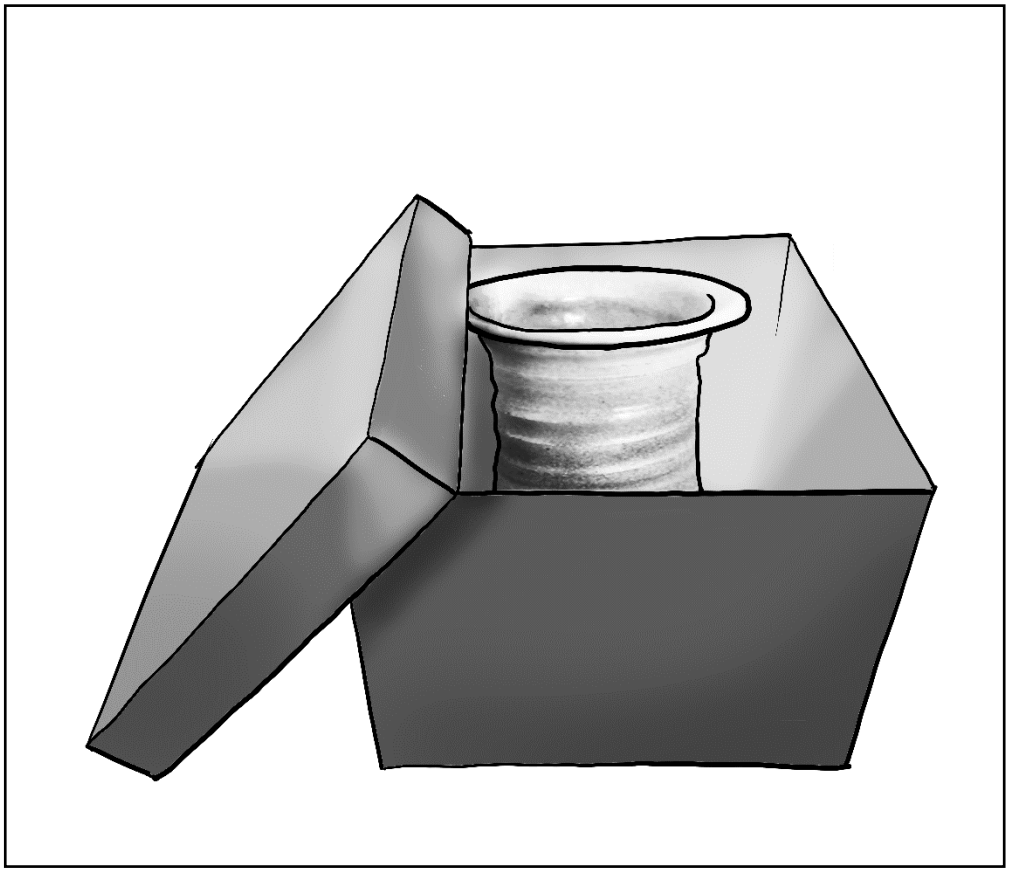
1- Large and Heavy Artifacts:

- Take the construction, weight, size, and shape of large artifacts into account before moving them.
- Make sure to secure or remove any loose or weak components before handling.
- Large artifacts should always be lifted, never pushed or dragged directly on the floor.
- Large artifacts should be placed on a trolley or in a frame for protection and ease of handling and transport, to avoid extra lifting.
- When using a trolley to move large artifacts, they should be placed in their normal position, and not standing or on their sides.



2- Small and Sensitive Artifacts:

- Small artifacts should be supported using individual supports or packed in bags, containers, boxes, or crates for carrying.
- Make sure trays and boxes are padded using archival museum materials (for example, polyethylene foam or acid-free tissue).
- Secure artifacts in separate compartments in a box or tray to prevent them from being damaged or disordered.
- To avoid abrasion, make use of acid-free paper and/or polyethylene padding materials as base and partitions.

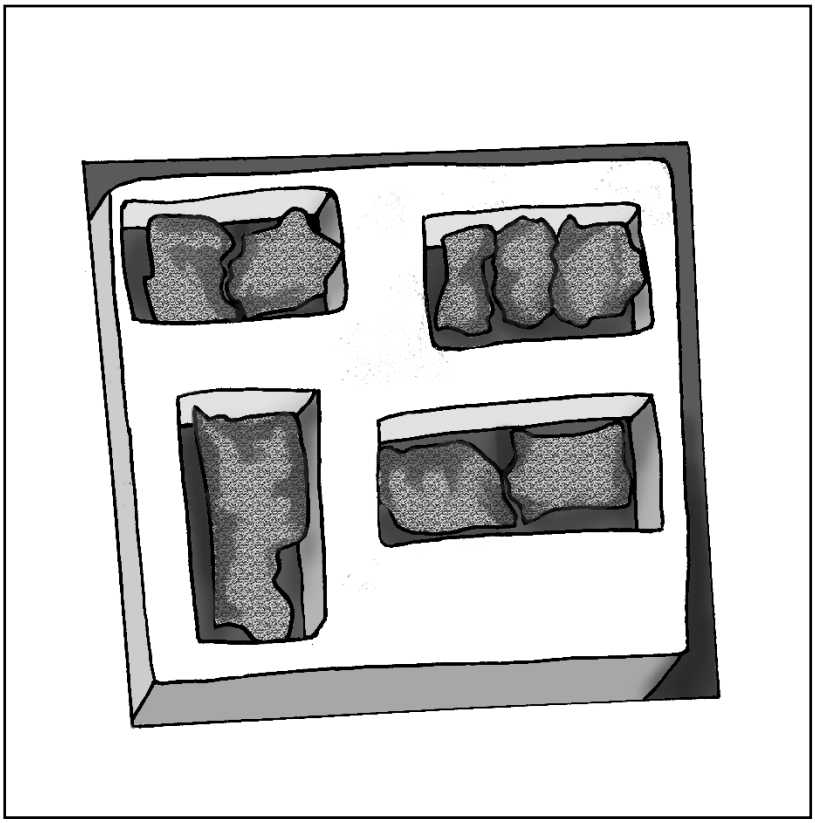


iii. By Condition

Before handling any artifact, the condition and structure of the artifact should be examined. If there are any records for the artifact, they should be reviewed for any previous treatment that took place or any past damages.

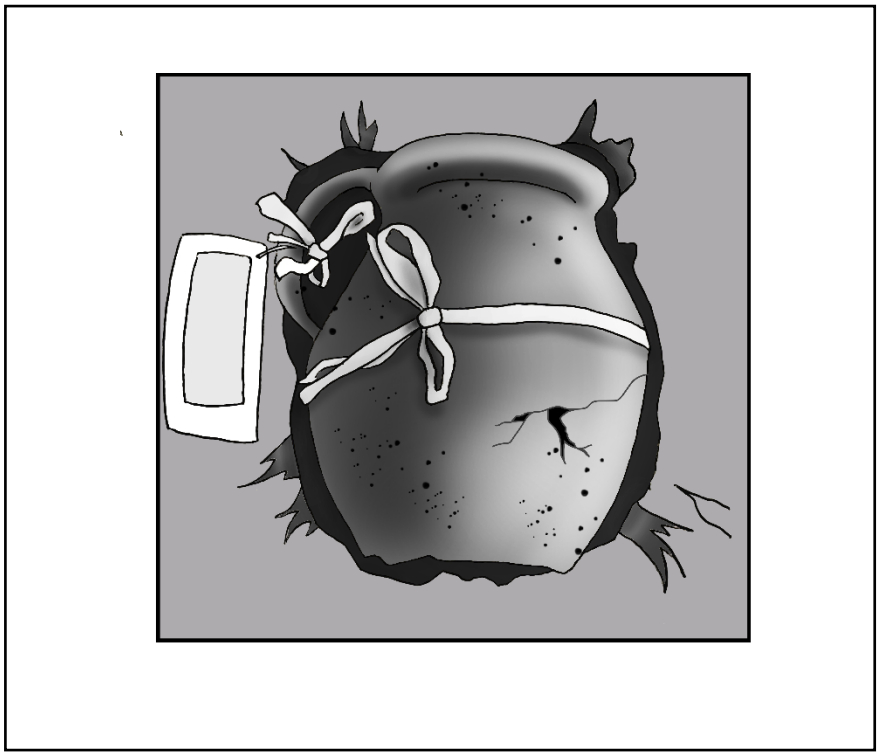
1- Fragmented or Damaged Artifacts

- Check for loose parts or fragile surfaces. Careful examination will usually reveal if an artifact is not stable.
- Check for flaking surfaces before handling. In the case of detached materials coming off of the artifact, the artifact should be handled with caution.
- Fragments of broken artifacts should be packed in a separate bag and handled together.
- Deteriorated artifacts should be handled with the advice of a specialist.



2- Conserved Artifacts

- Special attention should be carried out for conserved artifacts for different reasons:
    - Conserved artifacts that were mended can be fragile or have weak and strong parts in the same body of the artifact.
    - Conserved artifacts might be coated with chemical or pesticide materials; therefore, when handling these artifacts, gloves as well as a mask should be worn.
- In general, artifacts with fragile surfaces, structures, or with many loose parts typically need extra support during handling.



Part III: Museum Artifact Packing

Packing artifacts for shipment (photo by F. Marii)

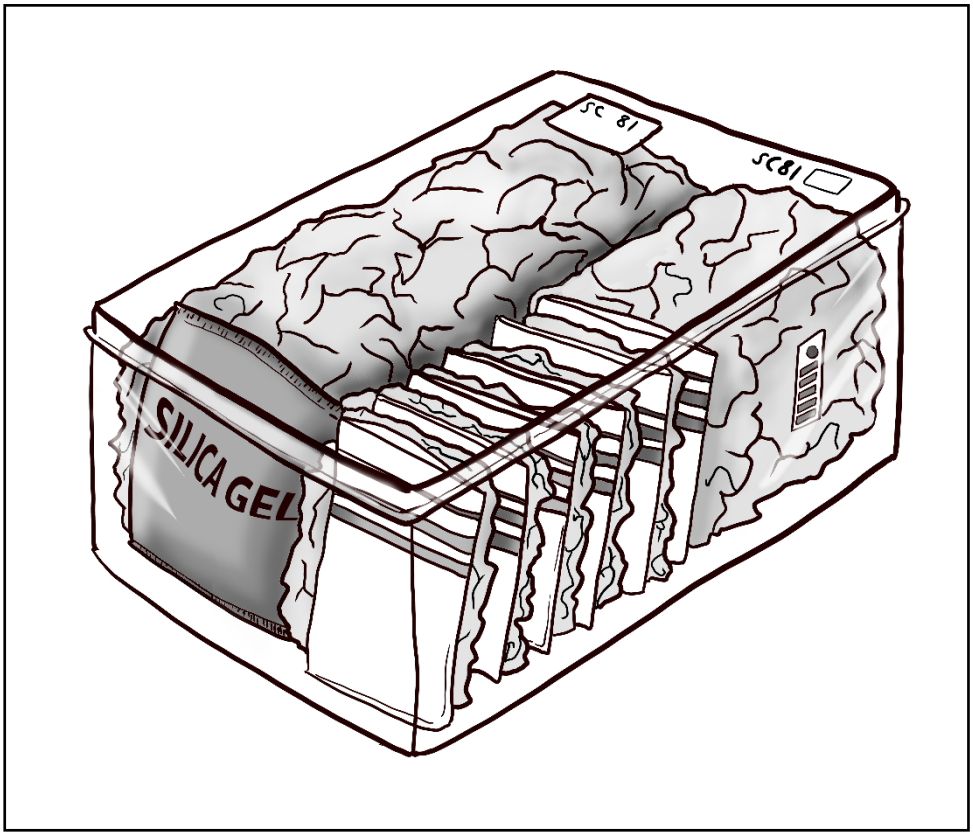
Part III describes how to pack artifacts for storage, handling, transporting, or shipping, and in what order to do so. Good artifact packing always depends on proper planning and organization. The importance of acid-free materials to be used in artifact packing is discussed in this part as well.

i. Packing Procedures

- Specialized packing requires planning ahead.
- Provide enough space to work comfortably with the artifact packing. For small ones, a table is needed, and for larger artifacts, enough room is required.
- Pad the table with a few sheets of polyethylene foam. Securely fasten the sheeting on top of the work surface.
- Remove all other tools and materials from the table while packing.
- Artifacts should be packed separately with appropriate packaging, especially the important and fragile artifacts.
- When wrapping artifacts, make sure that only archival-quality inert and acid-free tissue come into direct contact with the artifact.
- It is best to use crumpled acid-free tissue or inert foam for cushioning materials to prevent movement of artifacts in boxes.
- Cavity-packing involves placing an artifact in successive layers of materials (polyethylene foam), into which an opening is cut. The cavity-packing protects the artifact and will absorb vibrations created during transport. It also creates a micro-environment for the artifacts.
- Allow enough room for the artifacts in the cavity-packing.
- The artifact should be wrapped with acid-free tissue before being placed in the cavity or the cavity can be lined with tissue and then folded over the artifact without crushing it. The tissue prevents abrasion and the loss of fragments dislodged during transportation and also aids in the removal of the item from the cavity.
- During packing, a group of artifacts should not be overcrowded in one box; in fact, sufficient spacing should be left between artifacts to allow for handling, access, and proper air circulation.
- Separate artifacts while packing from each other using cushioning materials.

ii. Packing Materials

- Acids are harmful to artifacts because they can cause them to become brittle, break, discolor, or corrode.
- For this reason, acids should be kept as far away from the artifacts as possible.
- That is why it is important to use ARCHIVAL or ACID-FREE materials when handling and packing artifacts.
- These are the safest materials to use because they are inert, chemically stable, and will not off-gas acid that will later harm the artifact.
- Containers and materials for packing must be clean and covered with a soft, non-slip surface.
- Packing materials should be made of durable and compatible materials.
- Packing mounts should be designed to balance around a center of gravity and should not cause stress to the artifact.
- Polyethylene foam can be used to cavity-pack many solid, stable, three-dimensional artifacts. It is also good for very heavy artifacts.



- Packing materials can include the following:
    - Plastic (polyethylene zip-lock, sheets, containers with lids, bubble-wrap)
    - Foam (polyethylene foam)
    - Acid-free and inert paper and board
    - Sheets (unbleached clothes, Tyvek and it can be sewn)
    - Micro-environments (silica-gel)
    - Tapes, ties, and glues (double-sided tapes, hot melt glue)
    - Padding support (acid-free tissue, polyethylene foam)

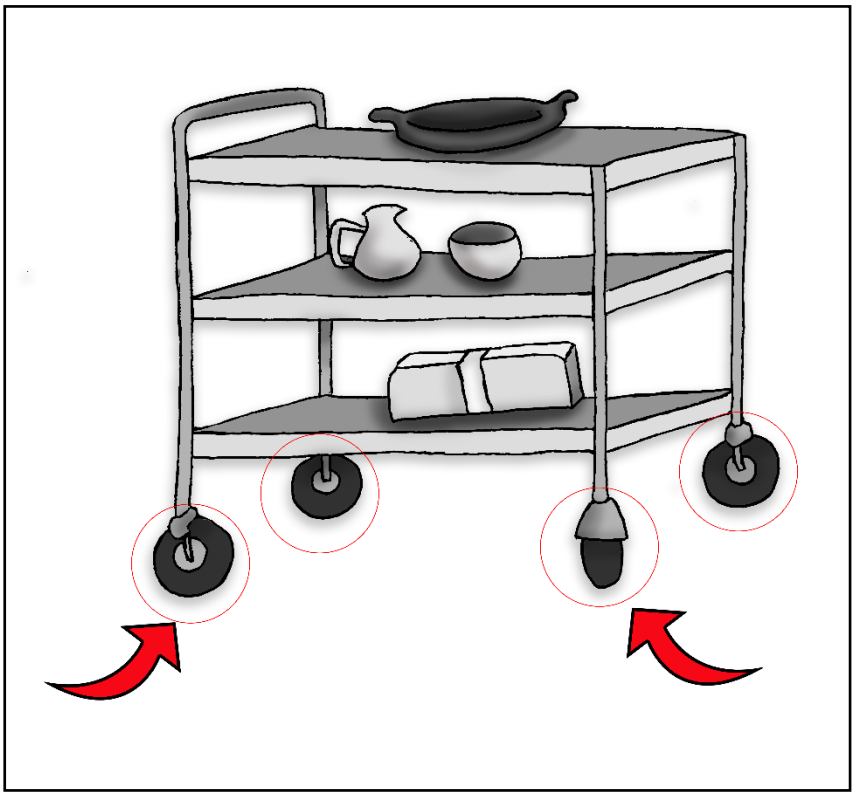
Part IV: Transport of Museum Artifacts

Cartoon photo from a conservation laboratory
(photo by F. Marii)

Part IV discusses packing artifacts for transportation inside the museum and packing artifacts for shipping or transferring outside of the museum. Packing techniques should have two concerns: minimum handling of the artifacts and simplified unpacking and repacking of the artifact. Moreover, when transporting artifacts, it is important to provide full support for each artifact and protection from vibration and impact. A handling sequence plan should be agreed on in advance if there is a group of people involved in transporting museum artifacts.

i. Inside the Facility (inside the building)

- Avoid moving artifacts during open hours at the museum.
- When transporting artifacts in a box or a tray, make sure that artifacts are in a horizontal position in the box.
- Trays and boxes should have smooth surfaces without sharp edges or corners.
- Heavy artifacts should be moved by cart/trolley.
- Trolleys inside the facility should be fitted with rubber wheels to keep the trolley in a stable position and absorb vibrations.
- Artifacts should not protrude over the side of trolley.
- Avoid overloading trolleys or stacking artifacts on top of each other on trays or containers.
- Provide padded trays or sandbag weights that will support artifacts on the trolley and prevent them from moving or falling off.
- Move trolleys at a steady, even speed and avoid sudden movements and abrupt stops.



ii. Outside the facility (for transfer or shipping)

- Packing museum artifacts for shipping can present a challenge. With proper preparation and planning, however, museum artifacts can be shipped safely and securely.
- Planning and preparation must precede the packing of museum artifacts; these include:
    - Inspect and document artifact condition
    - Select a safe method of shipment
    - Prepare a workspace
    - Acquire materials and equipment
    - Observe rules for safe artifact handling
- For any extramural transport (into another building), hermetically sealed boxing should be used.
- Package-within-a-package is a packing method that is cavity-packed artifacts placed in cardboard boxes that are then floated within an outer protective shipping crate that provides a safe, stable environment.
- Observe the following considerations during the packing process:
    - Artifacts must be properly supported at the strongest points.
    - Artifacts must be protected against the effects of temperature and relative humidity changes and against vibration caused by transporting.
    - Artifacts must be properly spaced within the box to avoid potential damage caused by crowding.
- Constructing boxes permits customizing the boxes to the dimensions and packaging needs of the artifacts. (See Appendix 2)
- On the exterior of the box lid, list the number of the artifacts in the box and note any instructions for special handling, unpacking, or repacking the box. Include photographs of the objects that are contained in the box.
- If transporting the artifacts outdoors, move them when the weather conditions are good, with no rain, ice, snow, or extreme heat or wind.
- Allow sufficient time to pack the artifacts without being hurried and without interfering with other work activities. The amount of time required to safely pack an artifact for shipment can last for hours or days.

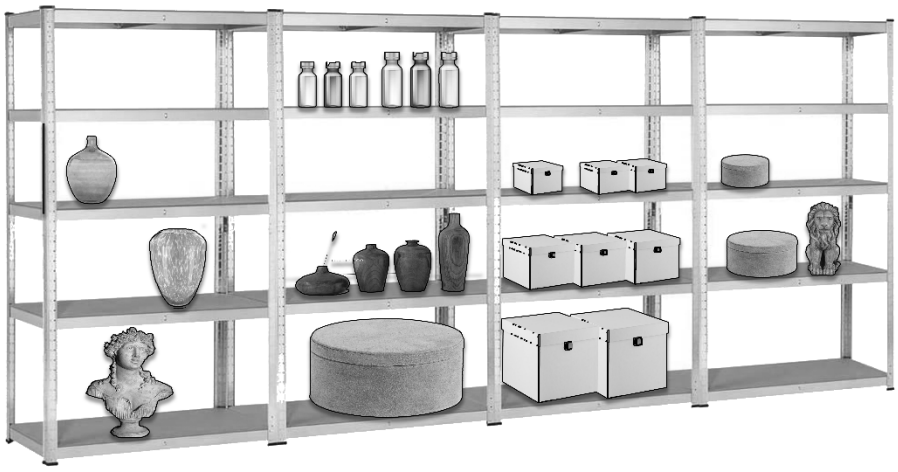
Part V: Artifact Storage

Old storage in Madaba Museum (Photo: F.Marii)

Part V discusses the importance of storage materials, what materials to use and avoid, and how to monitor artifacts in storage. Storage materials offer the first layer of protection to artifacts against dirt, dust, and other harmful influences. They are often in direct contact with the object and should therefore always be as chemically stable as possible, as any harmful substance in them will directly affect the object. Many materials that may seem suitable for storage or display purposes can cause serious damage to museum collections. They can cause corrosion, discoloration, or deterioration of objects, either because they give off harmful vapors or because they are in direct contact with the museum object. This section will discuss storage protocols for specific groups of materials such as metals, inorganic materials, organic materials, and manuscripts.

i. Storage Principles

- The storage area should ONLY be used for the storage of artifacts.
    - Do not store other materials in the same storage area.
- Maintain good housekeeping in storage area.
    - Regular dusting prevents dust accumulation and pest infestation.
- Maintain good air circulation and ventilation within the storage room.
- Keep artifact boxes off the ground, preferably placed on shelves. This prevents pest and water damage.
- Galvanized metal shelves that are free of sharp edges are preferable to wood shelves, as wood can release acids that are harmful to collection materials.
    - Wooden shelves are also more susceptible to pests.
    - Galvanized metal shelving is strong, smooth, inert, non-flammable and does not emit any harmful vapors.



- Plan and maintain good organization of collection storage.
    - A catalogue system helps efficient management of storage materials.
- Be aware of the effects of relative humidity (RH) on collection materials.
    - Materials react to RH by either expanding as they absorb moisture or contracting as they release moisture.
    - This fluctuating tension causes physical stress that can cause damage.
    - Keep in mind that some materials are more sensitive to RH than others such as organic materials.
    - For particularly sensitive artifacts, utilize protective containers with silica-gel packets.
- Be aware of the damaging effects of light and UV on some materials:
    - Organic materials, textiles, and artifacts with paints are most sensitive and should be kept away from direct light.
    - Inorganic materials are relatively stable; however, light could affect the information on their labels, so it is good principle to keep all artifact materials stored away from direct light.
- Always use archival quality materials (boxes, labels, and tape) for artifact storage.

ii. Metals

- *Storage*
  - Metal will corrode if exposed to moisture, so for this reason do not store metal artifacts near water sources such as near pipes or open windows.
  - Metals should avoid direct contact with water and high RH environments to prevent corrosion.
    - 30% or lower RH is ideal for metals, but 40-55% works well for most metals.
  - Ensure that storage materials are waterproof and/or utilize waterproof dustcovers.
  - Limit exposure to atmospheric pollutants and store metals in a well circulated room, preferably filtrated.
  - Keep metal artifacts off the floor and raised on shelves.
  - Do not store metal artifacts next to volatile materials such as organic artifacts, wood and wood-based products, latex/oil paints and coatings, or silicone/rubber sealants and adhesives.
  - Silica packets or other desiccants can help create a dry environment.
- *Care*
  - Dusting is essential; dust carries salts and particulates that attract moisture and initiate corrosion.
- *Deterioration- what to look for*
  - Signs of new corrosion: surface crackling, powdery or flaking surface material, new colors forming.
  - Copper alloy corrosion is red, brown, black, blue, and green.
  - Bronze disease is a light green corrosion product on archaeological metals that forms in the presence of chloride salts reacting with copper; this product reacts with moisture in the air to form green corrosion.
    - Active bronze disease must be stored at RH less than 42%.
  - Iron corrosion product is black, red, orange, yellow, and brown (rust).
    - Active rusting needs RH below 20%.
  - Silver corrosion (tarnish) is grey/black.

iii. Inorganic materials (glass, stone, and ceramics)

- *Storage*
  - Store the heaviest objects on the bottom shelves.
  - Don't stack small ceramic or glass vessels. If a critical lack of space requires stacking, place polyethylene foam between each object. Make sure the objects nest well and don't put pressure on each other.
  - If objects are unsteady due to their shape or to damage, store them in a stable position using padding with acid-free tissue.
  - Store medium or big ceramics and glass vessels on stationary shelves, preferably lined with foam or fabric, to avoid damage from vibration.
  - Make sure that artifacts are not protruding beyond the edge of shelving where they might be bumped.
  - Since ceramic, glass, and stone objects are all brittle, sufficient padding must be provided to cushion the object from any shock.
- *Care*
  - The agents of deterioration that can have the most profound effect on ceramics, glass, and stone in museum collections are direct physical forces.
  - Pieces of broken glass and ceramic artifacts should be kept together with clear labels.
  - Pad broken pieces so they don't abrade each other and keep them together in a bag or box.
  - Keep objects away from open windows, air conditioning vents, and heat sources.
- *Deterioration*
  - Ceramics can be vulnerable to changes in temperature and relative humidity as this can activate "soluble salts" that can crystallize at or near the surface and destroy decoration or even the ceramic structure.
  - Unstable glazes may develop cracks.
  - You may need to store unstable glass or ceramics in a microenvironment that keeps the RH at a lower level than the general storage environment to prevent salt efflorescence and weeping glass.

iv. Organic materials (textiles, wood, leather, bone, and ivory)

- *Storage*
  - Organic materials are highly susceptible to deterioration caused by light, relative humidity, temperature, air pollution, microorganisms, insects, and rodents.
  - Because of the size, diversity, and sensitivity of these collections, preventive conservation is the most effective method of preservation.
  - Store organic materials with acid-free materials and preferably in protective acid-free enclosures.
- *Care*
  - Organic materials are most sensitive to changes in RH and high temperatures so providing stable and appropriate environmental conditions is essential.
    - Ideal RH range is 40-55% with seasonal fluctuations of 15%.
    - Be aware that high temperatures can desiccate organic materials, so maintain good heat control by not storing organic materials in direct sunlight or near heaters/radiators.
  - Organic artifacts are also sensitive to atmospheric pollutants, so store in a well-ventilated and preferably filtered room, or in well-locked containers.
  - Consider including pollutant absorbers inside storage enclosures.
  - Organic artifacts lose their structural integrity as they age, so ensure they are well supported in storage by using archival quality mounts and supports.
    - Collapsed, creased, or folded organic materials will develop local weaknesses, so it is better to store these materials spread out.
  - Textiles will deteriorate more rapidly when they are in contact with acid-releasing materials, such as cheap mount board or acidic cardboard rolls.
    - Textiles should be stored flat, and if folds or rolls are necessary, ensure they are well supported with padding.
  - Remember to remove any pins and tacks used for mounting and framing which will rust when in contact with textiles or other materials with a natural moisture content and cause deterioration.

- Bone, ivory, and many other organic materials are adversely affected by the vapors from rubber ("foam rubber," vinyl tiles, flooring adhesives, and rubber-backed carpets).
    - Volatile sulphur compounds from rubber will cause a yellow or orange discoloration in ivory.
- Maintain good housekeeping of storage area by dusting regularly and checking for pests.

- *Deterioration*
    - Look for any discoloration, embrittlement, cracking, losses, and pest infestations.

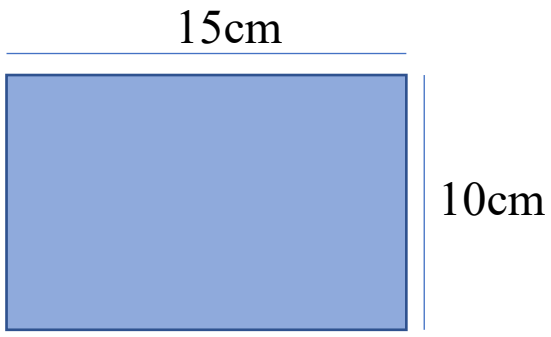
v. Manuscripts and paper artifacts

- *Storage*
  - Store artifacts horizontally with acid-free folders or acid-free boxes with lids interleaved with acid-free tissue.
  - Mount, backing, and adhesive materials must always be acid-free.
- *Care*
  - Frame under glass to protect the paper artifact.
    - Make sure the glass is not in direct contact with the paper; use spacers or a mat board.
  - Always keep away from direct light.
    - Inks and manuscript pigments are highly fugitive. Keeping them out of light is essential.
- *Deterioration- what to look for*
  - Foxing- reddish/brown spotting (mold growth).
  - Wavy surfaces- sign of too high humidity.
  - Accelerated fading- too much light exposure.
  - Browning/yellowing paper- acid damage from paper itself, paper framing, or environmental pollutants.
  - Pests- love to feed on paper.

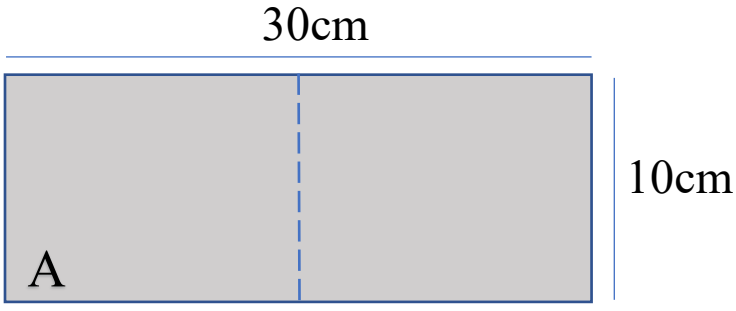
Appendices

i. How to Make a Sandbag Weight?

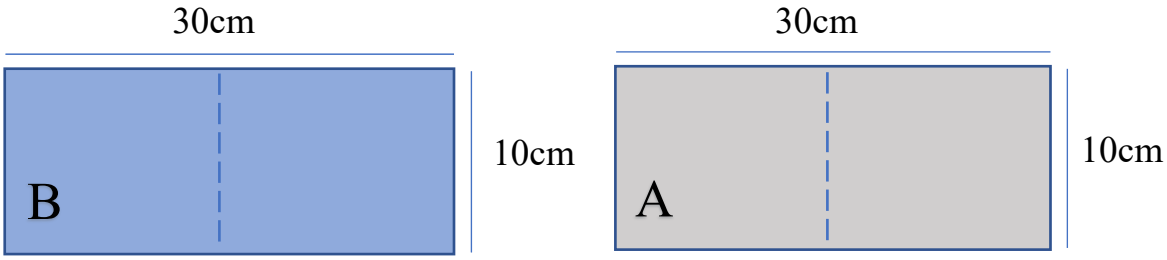
1. A bag can be any size or shape, so first decide which size and shape you want to make. For this example, we will be making a small 10 x 15 cm bag.



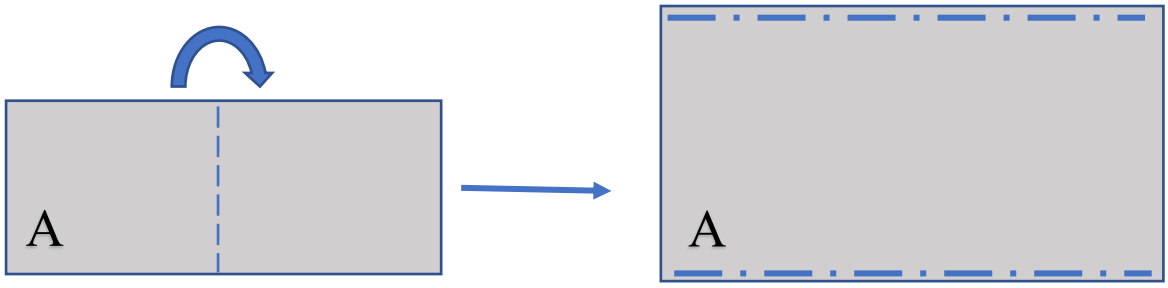
2. Cut a polyethylene sheet (A) into the dimensions you need. We will cut one sheet and fold it in half to produce the bag, so double the length of the bag and use that for your measurement. For the example bag, that would mean cutting a 10 x 30 cm sheet.



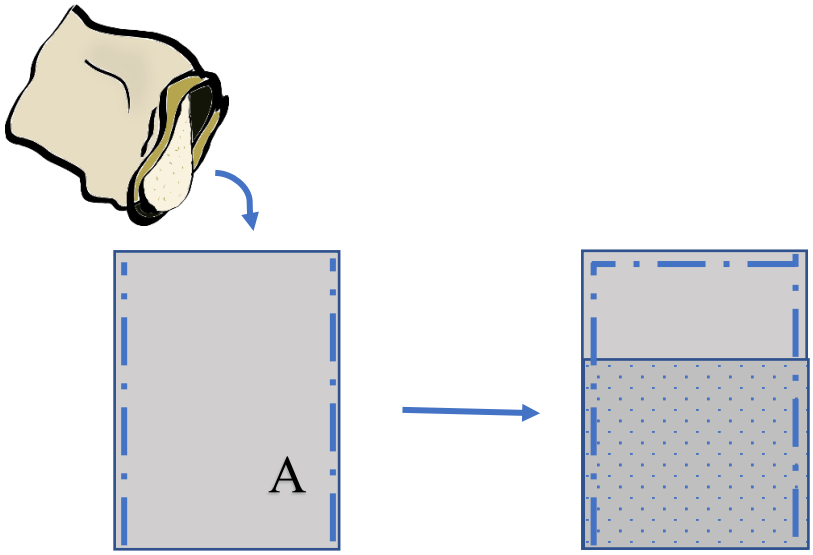
3. Cut the cotton fabric (B) with the same dimensions as you did in the previous step, so you will have two 30 x 10 cm pieces (one polyethylene [B] and one cotton fabric [A]).



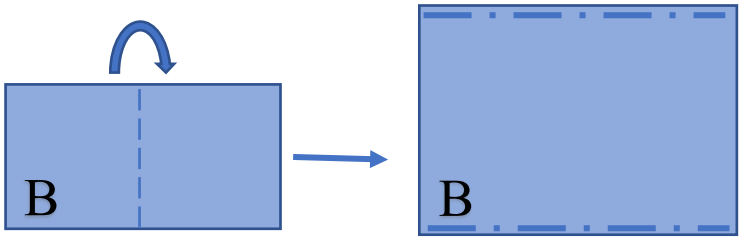
4. Fold the polyethylene bag in half and sew the sides tightly to make sure no sand will escape. Leave one side open so you can fill it with sand.



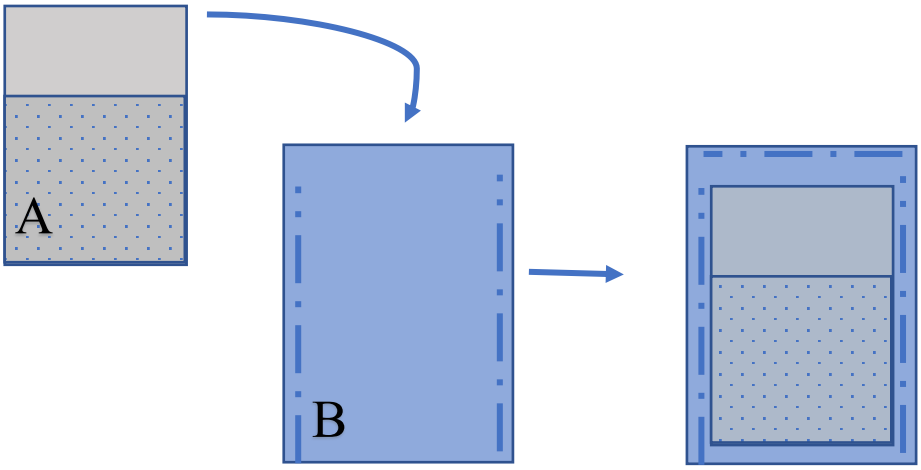
5. Fill the open end with sifted clean sand only ¾ of the way full. Then tightly sew the open end closed.



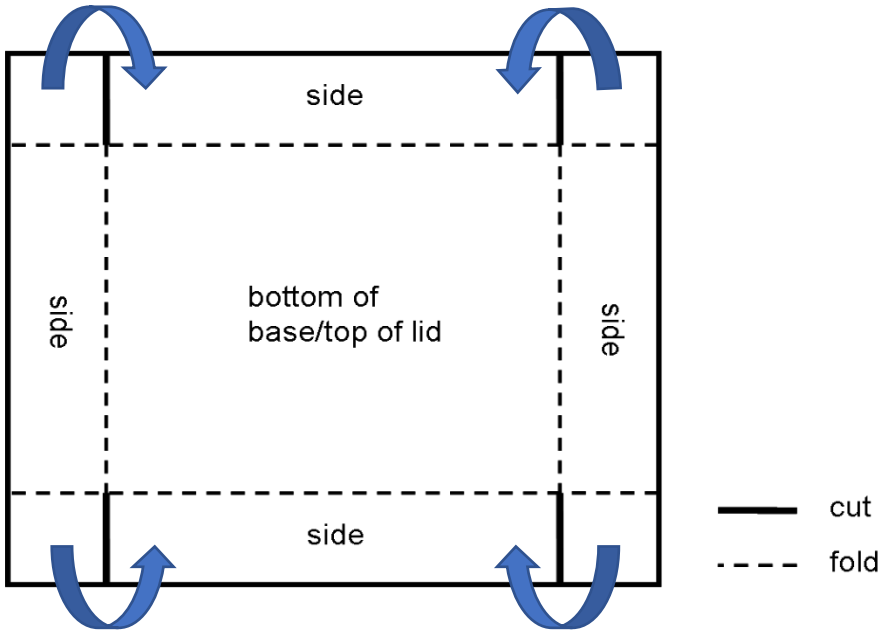
6. After your polyethylene sandbag is done, it is time to put it inside the cotton fabric casing. You will need to sew the fabric in the same way you did with the polyethylene bag. Sew the sides first and leave the end open.



7. Place the sandbag inside the cotton casing, then sew the end tightly closed.



ii. How to Make an Archival Box?



1. Measure your artifact to determine the dimensions you will need for your box. Remember to add box height into your measurements.
2. For lid, use the same measurements as above, but remember to add 3.75mm to dimensions on all sides to accommodate for the extra width created by the board.
3. Make your cuts and folds according the diagram provided above.
4. Fold all four box cuts in and glue with inert adhesive.
5. Repeat process with lid
6. You have a box!

iii. Supplies

Archival materials:

These materials are acid-free and lignin-free. These are the only materials that should be used for direct contact with the museum artifacts. These materials are used when conserving, restoring, preserving, exhibiting, and storing museum collections.

Acid-free paper/tissue/board:

These are papers, which when infused in water, yield a neutral or basic pH (7 or slightly greater). It can be made from any cellulose fiber as long as the active acid pulp is eliminated during processing. It is also lignin-free and sulfur-free. Sheets come in a variety of shapes and thicknesses. Acid-free tissue is good for general purpose wrapping and padding of artifacts.

Air-tight plastic/ polyethylene boxes:

These are commonly known as 'Tupperware' storage. When using them for storing museum artifacts, they should be always air-tight to maintain a controlled micro-environment for the artifact inside.

Bubble wrap:

Bubble wrap is not an archival material; therefore, it should not be used for long-term storage. It should also never directly touch an artifact, as it can leave an impression on some materials. Nevertheless, it is useful for wrapping artifacts that are being transported short distances. It is suitable as well for lining boxes and providing cushioning for fragile artifacts.

Cardboard boxes:

For long-term storage it is better to use acid-free cardboard boxes. These can be designed in different sizes according to their uses as explained in Appendix 2. Nevertheless, for short-term storage, cardboard boxes with stiff sides and no contamination from previous uses can be an option.

Galvanized metal shelves:

These are made of metals applied with a protective zinc coating to prevent rusting.

Gloves:

There are different types of gloves to be used with museum artifacts. Handling artifacts made from organic materials requires cotton gloves. Disposable nitrile gloves are better to wear when handling any other museum artifacts made of inorganic materials. Handling heavy or big artifacts requires reusable protection gloves.

Lab-coat:

It is known also as the white-coat, and the purpose of wearing it when handling museum artifacts is to protect the artifacts from any loose clothes, buttons, zippers, and belts, etc.

Labels:

The labels of artifacts must be waterproof, as well as the ink used to write on them.

Mask:

A medical face mask or even a cloth face mask is important especially when handling corroded metals, as some corrosion products are hazardous or toxic materials. A mask is also protective when handling old organic artifacts as they might be infested with micro-organisms or insects.

Polyethylene (bags, zip-lock bags):

These are good for smaller durable items. It is better to have of all different sizes in the museum to select the proper size for the required artifacts.

Polyethylene foam:

Polyethylene is a durable, flexible, closed-cell foam. It is inert, watertight, and impervious to most chemicals. It performs consistently through a wide range of temperatures. It adheres to itself and other polyethylene-based materials with

industrial-grade hot glue. It comes in a number of colors, densities and thicknesses. It is typically used in artifact handling as a versatile and chemically stable shock-absorption and vibration-dampening material. In fact, it is highly recommended for cavity-packing lightweight objects or full-contact cushioning over broad surfaces. It carves well with sharp knives for precise contouring of cushioning pads.

Sandbag weights:

These can be excellent supports for museum artifacts during transporting inside the building. They protect artifacts from vibration and shocks. See Appendix 1 for the method of making them.

Silica-gel/silica-gel packets:

It can absorb and release a large amount of moisture quickly as the ambient humidity changes. Usually it is placed in a plastic bag with small perforations to allow the silica-gel to absorb moisture. Holes can be made using a tooth pick. The bag with the artifact should also be perforated. Usually the color of the silica-gel is the indicator when it needs to be dried. To re-dry the silica-gel, it should be placed in a thin layer on a backing tray and placed in an oven at 110°C for about two hours, or until the color of the silica-gel indicates the drying state. Allow the silica-gel to cool before placing in an air-tight container. Be careful to wear a dust mask and gloves when handling silica-gel, as it is a desiccant.

Tapes & Adhesives:

There are a variety of tapes and adhesives to be used during packing of museum artifacts. It is always better to select acid-free tapes and adhesives. Try not to let the tapes and adhesives touch the artifacts itself.

Trays:

Trays should be shallow plastic carriers to fit small artifacts in during transporting inside the building. It is always better to keep them padded with acid-free paper under the artifacts to prevent damage from vibrations.

Trolley/Cart:

They can be useful inside the museum to use for lifting and transporting artifacts. Trolleys can be used for lifting and transporting big and heavy artifacts inside the museum, as well to move shipping boxes outside the building. They come in different sizes, and museums can get what is most suitable for their collections.

Tyvek sheets/labels:

Tyvek is a synthetic cloth that is excellent for making cushions, storage supports, and covers for artifacts and shelves. It is waterproof yet breathable. The smoother side should face the artifact, while the fluffy side faces outwards. Tyvek can be joined with a sewing machine or hot melt glue. Tyvek labels are used as well for artifact storage, since it is a strong, water-proof, and tear-proof material.

Unbleached sheets/fabric:

This is a material that is not made whiter or lighter by a chemical process, which means no chemical materials were added to it, and it is therefore an inert and acid-free material. This can be useful for making the cushions, padding, and covering support especially for artifacts made of organic material.

Resources

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