The Care and Preservation Of

Documents and Works of Art on Paper

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Introduction

Documents and art works on paper can be maintained for years of use and enjoyment provided that some basic care and attention is given to their preservation. The conservation staff at The Henry Ford has compiled the information in this fact sheet to help individuals care for their objects and collections. The first step in the care of collections is to understand and minimize or eliminate conditions that can cause damage. The second step is to follow basic guidelines for care, handling, and cleaning.

Documents and works of art are created on various kinds of background supports. This fact sheet addresses the preservation concerns of documents and works of art on paper, made from plant fibers. For information concerning other material types and supports for art works and documents collections see the listing of available conservation fact sheets.

Art on Paper

Humans have made marks that can be acknowledged as drawings and printings dating back to the species' origins. Inscribed papyrus supports from the ancient world date to at least 2500 B.C.E. Parchment was used as a support in Asia Minor as early as 200 B.C.E. Paper was invented by the Chinese in the early centuries C.E. When printing presses were used during the medieval period, the demand for printed material skyrocketed. There are various processes of paper making that involve different materials, including mineral, synthetic, and organic fibers. Paper made around the world utilized different materials such as linen, cotton rags, tapa cloth, palm fronds, and the Chinese "rice paper plant". This fact sheet will focus on the organic substances made for paper artifacts.

The media inscribed on paper materials also varies. Graphite, pencil, paints, pastels, charcoal, chalk, and ink are a handful of common media found on documents and art works. All of which are prone to deterioration such as powdering, flaking, smudging, and fading of the media. Iron-gall ink used for writing during the early twentieth century is known to cause holes in paper as the gallic acid reacts with the iron, causing corrosion to form on the paper. Knowing what your documents and works of art on paper are made of helps in knowing how to preserve and enjoy them for years to come.

Please note - this fact sheet will present a brief overview of the care of paper documents

and works of art on paper, stressing good storage and proper handling as the best methods of preservation. It does not address the disastrous damage caused by fire, water, pests, and other agents of deterioration. Please contact a conservator if you need specialist assistance with conservation of these materials.

Types of Damage to Documents and Works of Art on Paper

Poor handling and inappropriate storage are the major causes of damage to works on paper. Inappropriate storage refers to either an area that is not properly environmentally controlled, or storage that physically stresses the object. Documents and art works on paper can become brittle or fragmented over time due to high levels of acidity in the materials used to create the artifact. Clear plastic tape is often used to repair damaged paper artifacts but is a bad remedy that causes more harm. As tape ages, the adhesive embeds into the archival material's fibers causing staining, dirt attraction, and harm to the text or image when removal is attempted.

Acid deterioration – Cellulose is extracted from wood pulp by the use of strong chemicals to make paper. Acids remain in the paper after the pulping process. As the paper ages, additional acids accumulate and damage the molecular structure of the lignin which causes the documents to darken in color and become brittle.

Physical force - Physical damage to paper documents and works of art is quite common as materials are susceptible to tearing, creasing, flaking, and breaking. Involuntary damage often happens when attempting to remove paper artifacts from inadequate support materials, or removing degraded adhesive. Refer to a professional conservator to repair tears, breaks, and losses. Handling of original and fragile materials should be kept to a minimum.

Light - Excessive light causes fading, bleaching, darkening, and weakening of paper and the media attached. Daylight and ultraviolet light cause severe and permanent damage to documents and works of art on paper when not filtered out.

Incorrect humidity - Relative humidity (RH) levels above 65% cause mold growth. High humidity also causes small brown spots and sometimes pinholes to form on the paper called foxing. It is considered mold growth that forms due to impurities in the paper structure or the type of sizing material applied during manufacture. Drastic changes in RH can cause buckling and deformations in the paper. Levels below 25% RH cause brittleness and curling of the paper. Mold fungus feeds on dead organic matter, including paper.

Pollutants - In cities and areas of high pollution, oxidation rates increase which cause damage to paper materials. Gaseous pollutants convert into sulfuric acid within the paper and cause disastrous effects. Dirt and dust attach to the surface of paper materials and can be very abrasive and acidic. Dirt traps moisture, which also promotes mold spore growth.

Pests - Insects and rodents are attracted to organic materials. Good housekeeping practices include no food, drink, or smoking in storage areas. Fumigants used for pest infestations can cause chemical reactions with organic materials. It is best to avoid chemicals and use non-chemical methods to control infestation.

Water - Water, whether in liquid or gaseous form can be detrimental to paper materials. Impurities in the paper and/or water cause tide lines to form which stain the paper. Moisture also causes buckling of the paper which may cause paints to flake.

Storage of Documents and Works of Art on Paper

As with most materials, proper storage is the first line of defense against damage of documents and art works on paper. In an ideal world, paper materials would be kept in an environment of 45°F and an even, low of 30% relative humidity (RH). In most homes, an even environment is difficult to ensure. The best storage is the dry areas of a building, away from exterior walls, attics, basements, and leak sources with the addition of fans and dehumidifiers. However, exhibit and work areas, are optimally maintained between 60-70°F and 45-55% RH. Prevent rapid fluctuations in either RH (±3-5% daily, ±10% seasonally) or temperature (±2-3°F daily, ±10-20°F seasonally), as drastic changes in temperature and humidity accelerate deterioration of paper and ink. RH levels above 65% will encourage mold growth. Humidity sensors are available through suppliers listed at the end of this document for those who wish to check conditions near their collections. Do not allow dust to accumulate on stored objects.

An integrated pest management (IPM) approach should be considered to prevent the common insects and rodents that target documents and works of art on paper. The most effective measure to prevent termites, cockroaches, silverfish, book lice, and bookworms from attacking is to maintain the RH levels consistently and use air-conditioning or fans to circulate air. Caulk cracks and holes larger than ¼" in the exterior of the building to prevent rodents from entering. Mechanical traps are preferred to chemical products.

While in storage, keeping your paper materials in non-illuminated areas is best to prevent fading of sensitive pigments and inks. Eliminate ultraviolet radiation as much as possible

using curtains or blinds on windows. Plastic filters, such as Plexiglas are helpful on both windows and light tube sleeves to prevent transmission of harmful UV light. UV filters should be checked every six months, and can last for up to ten years. Condensation on windows shortens the life span of UV filters. The light level recommendations for storage are 10-50 lux (1-5 footcandles) and work areas are 330-660 lux (30-60 footcandles). UV levels should be maintained at less than 0-10 µW/lumen. Light sensors are available through suppliers listed at the end of this document for those who wish to check conditions near their collections.

You can protect your collection by storing mounted, framed, or loose paper documents and works of art on noncorrosive furniture cabinets or drawers made of aluminum or steel. Wood cabinets and shelving should be avoided. Documents and art works can be stacked together with interleaving of acid-free paper, enclosed within solander or storage boxes made of acid-free and lignin-free boards or corrugated Coroplast, or high-quality paper enclosures. If possible, store paper artifacts mounted to high-quality (conservation-quality) mat boards so as not to cause localized discoloration, or mat burn. Ensure materials do not slump, move about, or slide underneath one another. Never use paperclips, rubber bands, acidic paper bookmarks, sticky notes, tapes, or adhesives on paper artifacts. While lamination may seem like a protective solution for paper documents and art works, never encapsulate artifacts with heat because this is an irreversible process.

Handling of Documents and Works of Art on Paper

Paper artifacts should be handled with clean hands because dirt, salts and oils from skin absorb into the archival artifacts causing permanent damage. If the document or artwork on paper is mounted on a matboard, handle it by the mount. If the mount is original to the artifact and in a fragile state, use an acid-free, rigid board to safely support it from underneath when moving the object.

Light causes cumulative, irreversible damage to paper documents and art works, but can be controlled by simple measures. Exhibited artifacts should be kept at light levels of 50-150 lux (5-15 footcandles). When displaying materials, use LED bulbs instead of fluorescent when possible. Eliminate harmful ultraviolet light by using UV-filtered glass or Plexiglas on framed materials. If it is impossible to keep documents and art works on paper away from windows and skylights, use curtains or blinds to block out harmful daylight and UV. Inscriptions written on documents are likely to fade while on display. Display original paper materials for no longer than 6-8 weeks at a time.

Cleaning & Care

At least once a year, paper collections and storage areas should be inspected and dusted.

Accumulated surface dirt is best removed with a soft, natural bristle brush or air bulb to lightly remove the loose surface dirt. Work on a clean, flat surface with weights to keep the paper from shifting during cleaning. Begin by brushing from the center of the paper artifact and work outwards, using light pressure. For an explanation of this process see: https://www.youtube.com/watch?v=dwK-hTNflMo

If the paper is still dirty, tougher surface dirt may be reduced or removed with erasers and eraser crumbs (Staedtler Mars Plastic and Eberhard-Fiber Magic Rub), but take care to avoid fragile text and inscriptions, decorative illustrations, embossed stamps, colors, and sensitive areas of media so as not to cause smudging. Beware of flaking ink and paint on art works.

Documents and works of art on paper are highly susceptible to tearing. It is recommended to contact a professional conservator to handle paper mending. If sections of the paper have torn away, place the pieces between Mylar sheets and keep with the artifact until treatment can be performed.

Disaster Response

Documents and works of art on paper are typically high priority in the case of many disasters due to their fragility. Before an unforeseen event occurs, have a record of collections and keep routine building maintenance updated. Paper documents and art works should not be stored beneath pipes or stacked on floors.

Further discussion on disaster response can be found in various online resources including:

https://www.nlm.nih.gov/hmd/preservation/videos.html

BIBLIOGRAPHY

The Canadian Conservation Institute. CCI Notes 14/3, 14/4, 14/10, 16/1, 16/4, 16/5.

Cowan, Janet and Sherry Guild. Dry Methods for Surface Cleaning Paper. CCI Technical Bulletin No. 11, Ottawa, 2001.

Daniels, Vincent, Alan Donnithorne, Perry Smith, eds. “Works of Art on Paper, Books, Documents and Photographs: Techniques and Conservation.” Contributions to the Baltimore Congress 2-6 September 2002. The International Institute for Conservation of Historic and Artistic Works, London.

DePew, John N. A Library, Media, and Archival Preservation Handbook. ABC-CLIO, Inc., Santa Barbara, 1991.

Ellis, Margaret Holben. The Care of Prints and Drawings. AASLH Press, Nashville, Tennessee, 1987.

Kim, Kennis. Conserving, Preserving, and Restoring Your Heritage. Dundurn Press, Toronto, 2010.

Ruzicka, Glen. Disaster Recovery: Salvaging Books. Conservation Center for Art and Historic Artifacts, Philadelphia, 2002.

Useful source:

Northeast Document Conservation Center
https://www.nedcc.org

SUPPLIERS

Matting, Framing, Storage Supplies, Light Sensors:

- Conservation Resources International L.L.C.
  http://www.conservationresources.com
- Light Impressions
  http://www.lightimpressionsdirect.com
- Hollinger Metal Edge
  https://www.hollingermetaledge.com
- TALAS
  https://www.talasonline.com
- University Products
  https://www.universityproducts.com

Nitrile and Cotton Gloves:

- Gaylord Archival
  https://www.gaylord.com
- Uline
  https://www.uline.com

Brushes and Erasers:

- Arts/Crafts supply stores

Humidity Indicators and Dust Cloths:

- University Products
  https://www.universityproducts.com
- Gaylord
  https://www.gaylord.com

To Find a Conservator:

The American Institute for Conservation of Historic & Artistic Works
https://www.culturalheritage.org/about-conservation/find-a-conservator