

Once something happens to damage a family treasure it's too late but thinking ahead and preparing, together with knowledge about first steps, can save those family treasures from ruin.

Light

Light causes extreme and irreversible damage to many materials, most notably organic materials (those that derive from plants and animals). These include furniture, textiles, prints, books, drawings, manuscripts, wallpaper, dyes and inks, feathers and fur.

UV radiation and visible light set off chemical changes in paper and textiles, which weaken and discolour them, and cause inks, dyes and pigments to fade, seriously affecting the aesthetic quality of many items.

Infrared radiation is less energetic than UV radiation and visible light. It heats materials and can cause them to expand, leading to mechanical stresses and can also cause chemical changes to progress more rapidly. As a result, infrared radiation can increase the destructive effects of visible light and ultraviolet radiation.

Once started, photochemical reactions can continue even after the exposure to light or UV radiation has stopped. This means the deterioration of objects does not stop when the objects are placed in the dark.

Some materials are **highly susceptible** to damage through photochemical reactions.

Textiles:

- Light and UV radiation are the greatest enemies of textiles. Colours will fade and the fabric will become fragile and will split easily.

Pigments: (watercolours, prints)

- Organic pigments, those of plant or animal origin tend to be more sensitive than others.

Paper:

- Mass-produced modern papers are made with untreated wood pulp in which the lignin, the substance in trees that gives them their strength is left in the paper. Lignin is very reactive and is susceptible to photochemical deterioration that produces yellow–brown discolouration responsible for yellowing crumbling at the edges of inexpensive papers like newsprint.

Chemical bleaches can be used to whiten the wood fibre, the residue of which works against the structure of the paper, embrittling it. Foxing is a term describing the age-related spots and browning seen on vintage paper documents such as books, postage stamps, certificates, etc. Although unsightly and a negative factor in the value of the paper item for collectors, foxing does not affect the actual integrity of the paper.

Materials **moderately susceptible** to light damage include oil paintings, horn/bone, wood furniture.

Mitigating light damage

Light damage results from a combination of intensity and exposure time and cannot always be totally prevented, but the rate of deterioration can be limited and slowed:

- avoid displaying objects in direct sunlight or at very least, use curtains or blinds over windows and skylights to diffuse and filter light
- minimize the use of unfiltered fluorescent or halogen lights or use compact fluorescent light (CFL) bulbs which typically emit very low levels of UV. Less than 10% of the energy used to power an incandescent light bulb is converted into visible light, meaning they are not very efficient. A much smaller amount of power is converted into UV radiation, making incandescent light bulbs a low emitter of UV radiation.
- remember that the intensity of the light is greater the closer the light source is to the object.

Temperature and Humidity

Heat really needs no explanation. You may have difficulty defining it, but you're certainly familiar with the experience of it.

Humidity is water damage. Water is an extremely pervasive substance and can be found everywhere, including in the air, where it's held as vapour. The capacity of air to hold water-vapour varies according to the temperature of the air: the warmer the air, the more water-vapour it can hold. As the air cools down, its capacity to hold water will decrease, thus evening dew.

Relative humidity is a measure of the amount of the amount of water-vapour contained in air at a particular temperature. Shown as a per cent, it is a comparison between the amount of water-vapour held in the air at any one time and at a particular temperature and the total amount of water-vapour which the air can hold at the same temperature.

Extremes of temperature and relative humidity, particularly rapid fluctuations in these, can lead to a range of problems. In high relative humidity conditions insects and moulds thrive and reproduce readily, metals corrode, dyes in textiles may bleed, organic materials such as wood and leather swell or change shape, gelatin emulsions and adhesives become sticky. Fluctuations in temperature cause expansion and contraction. If this is uneven and/or rapid, it can cause physical damage and distortion, especially hazardous for objects made of composite materials or components. Joints in furniture will loosen with repeated expansion and contraction.

Organic materials absorb water. This is particularly noticeable in thinner materials like paper, vellum and parchment, textiles, leather and bark. As materials absorb water, they swell and change shape. Stretched vellums and mounted textiles, like painting canvasses, sag. The emulsion layer of photos can get sticky so negatives and prints can stick together. Adhesives soften and joints loosen and veneer warps.

Damage to objects can't always be prevented totally but it can certainly be limited and slowed by controlling the relative humidity and temperature. Although buildings are not fully sealed from the

outside weather they act as barriers to the free flow of heat and moisture. Air conditioning and heating are effective in providing a comfortable climate for us and our cherished belongings.

Within buildings there are localised climates and microclimates where conditions vary greatly from conditions in other parts of the building; there would be greater variations in temperature and humidity in a small kitchen or bathroom than in a bedroom or storage room. Closets, boxes and frames act as barriers to air and moisture circulation and can develop their own microclimate or create buffer zones between your objects and the extreme or fluctuating conditions.

The most stable area of a non-air conditioned building is an internal room on the ground floor because it is buffered against climatic changes. Basements are acceptable as they provide a cool temperature but they are likely to be damp and in our climate, susceptible to flooding. On the other hand, an attic would be dry but probably not insulated and subject to wild temperature fluctuations. If you must store in the basement or attic, place the items in plastic tubs or bins and ensure that lids are secured tightly.

The optimum relative humidity is $50\% \pm 5\%$, a compromise to keep organic materials from shrinking and drying and metal objects from corroding. The danger zone for relative humidity is over 65%, when mould grows and metal corrosion is common, and below 35%, when some materials dry out and become brittle. In BC's climate, $60\% \pm 5\%$ is more realistic but it means that we have to be vigilant for signs of humidity-related damage: mould, corrosion, insect activity.

If you are unable to store your materials under ideal environmental conditions, even small improvements can still be beneficial. Simply moving items from an attic with highly unsuitable conditions to a room on the main floor will increase the life of your treasures by $3\frac{1}{2}$ times. Moving things from such hot, humid attic conditions to a less adverse environment provides a tenfold improvement in the life of paper artifacts, such as family photographs and bibles. Using an air conditioner or a dehumidifier may be a cost-effective way to achieve a stable, cool, dry environment.

Environmental contaminants that affect the condition and longevity of family heirlooms:

- smoking
- cooking
- oxygen = metal oxidization "tarnish"
- furniture polish
- off-gassing
 - wool = sulphur – metal tarnish/corrosion
 - cling film = vinylidene chloride (chlorine) – **corrosive**

Pests

In nature insects and moulds perform the vital task of reducing animal and plant products to reusable chemicals, an important part of the cycle of life. There are numerous species of insects and moulds with an equally huge range of habitats, food sources and behaviours.

If they are not controlled, insects and moulds can severely damage many types of organic materials but controlling them can be much more complicated than just buying a can of insecticide or calling a pest control company. Chemical warfare on insects and moulds can have very serious effects on humans. Many of the chemicals used are toxic and can damage our treasures and our environment.

It's important to be able to recognise the signs of insect and mould activity so you can begin to treat the issue before it's completely out of hand.

Mould

Moulds digest and break down the materials they feed on. In the process, paper, textiles and wood become weak and eventually crumble away. They also produce coloured materials which stain wood, paper and textiles. These stains can be extremely difficult to remove, because they are often insoluble. Even when they are soluble, the stained material is often too weak to treat. The best way to control mould is to prevent it which can be challenging because mould spores are everywhere.

- make sure there is adequate ventilation in storage areas
- provide a physical barrier; make sure all materials which could support mould growth are stored in acid-free wrappers or clean cotton dust covers
- inspect stored treasures regularly; don't let the mould grow for months before you find it.

If you do develop a mould problem:

- Isolate the object or objects: put them in a plastic bag in freezer to halt any action. If the outbreak is throughout a storage area you may need to remove all of the items and thoroughly clean the whole area to stop the mould growing again. If necessary, use a shop vac to remove water from floors and carpets then clean the vacuum itself, as mould can accumulate inside the tank and hose. Scrubbing the affected areas with water and detergent and make sure the cleaned area dries quickly to prevent new mould colonies from developing. You must make sure to wear protective gear, such as rubber gloves and a facemask, as many moulds are toxic.
- If the object can be laundered or washed, do so. If not, thoroughly dry the object then clean it with a soft brush and vacuum. With a soft brush, gently sweep the mould toward the suction pipe of the vacuum cleaner. Wear a facemask.
- Take steps to correct the problem. Clear the gutter, buy a dehumidifier or change your storage system to allow more ventilation. It is important that you deal with the problem or it will happen again.

Insect Damage

Insects eat organic materials, leaving them damaged and weak. In some cases, the damage is obvious: holes in textiles. In other cases, you have to inspect things carefully to find the damage: wood borers.



Carpet beetle

Larvae "Woolly Bear" 3mm long

Adult beetle 2 - 3mm long

- natural fibres, paper, hair, feathers, insect specimens
- look for holes in textiles and paper, living caterpillars and larval casings
- check windowsills for adult beetles



Clothes Moth

Larvae, cocoon 8mm – 1 cm long, usually in clusters

Adult moth 8mm - 1cm long

- natural fibres, paper, hair, feathers, insect specimens
- look for holes in textiles and single or clusters of larval casings



Silverfish

Adult – 1 cm long

- paper, fabrics – especially starched cotton and linen, photographs, book bindings and organic adhesives
- look for living adults, especially in damp areas

Managing Pest Issues

Make the environment undesirable:

- physical exclusion - door sweeps and seals.
- good housekeeping - a clean environment helps to deter or reduce most pest problems because there will be no food for them. Vacuuming instantly reduces insect numbers by removing them, their eggs and any materials they have left behind.
- maintaining good environmental conditions - RH, temperature, air circulation.
- monitoring the area by inspecting the area regularly; placing and inspecting insect traps.

If a pest infestation is found, implement nonchemical eradication methods first:

- inspect and remove all infested or suspect material. Bag and seal material to contain infestations and freeze for a minimum of 72 hours.
- thoroughly inspect neighbouring material and clean the area by vacuuming.
- install blunder (sticky) or pheromone traps.
- carry out subsequent inspections as eggs may not have been killed by freezing or completely removed by vacuuming.

Care and Handling by Type

Paper/Documents

Includes unbound paper materials; documents, manuscripts, drawings, prints, posters and maps.

Taking care when handling them is the first step in long-term conservation:

- have clean hands and a clean work area
- keep food and drink away
- use pencil, not ink, to make any necessary marks or inscriptions; in addition, only make inscriptions when the paper is on a clean, hard surface, to avoid embossing the inscription into the paper, which will be visible from the other side
- don't use paper clips, other fasteners, "dog ear" folding to mark or organize leaves, rubber bands, self-adhesive tape, and/or glue on paper

Good storage significantly prolongs the preservation of paper materials and includes:

- cool (room temperature or below), relatively dry (about 35% relative humidity – feels dry to you), clean, and stable environment - avoid attics, basements and other locations with high risk of leaks and environmental extremes away from radiators and heat vents.
- minimize exposure to all kinds of light; no exposure to direct or intense light
- enclose documents in protective cardboard enclosures and store them flat or if oversize, rolled

Books are stored in much the same way with the additional storage suggestions:

- regularly dust the tops of shelved books and surrounding shelf areas
- shelve books of similar size together so that the face of the covers are well supported by the neighbours on each side
- keep upright shelved books straight and not leaning so they don't develop a bow in the spine, or store lying flat
- newspapers from the mid-19th century onwards are printed on inexpensive, machine-made, wood pulp paper that is not manufactured for longevity. Due to the inherent chemical instabilities of such low-quality wood pulp papers, these newspapers are inherently acidic.

Good storage as outlined above is especially critical to the preservation of acidic papers but apply to all newspapers. If you can digitize any newspaper content you'd like to keep before the paper develops acid-related yellowing.

Silver

A thin layer of dark tarnish can quickly destroy the surface lustre of silver. Tarnish consists mainly of black silver sulphide and is caused by sulphur containing compounds such as hydrogen sulphide in the air. Materials that accelerate tarnish include wool, felt, gasoline fumes, motor oil, latex gloves or carpet padding and cooking fumes from certain foods such as eggs, onions and mayonnaise. Tarnish can be removed from silver mechanically with a polish; chemically with a dip; or electrochemically but each of these takes away a certain amount of underlying silver along with the surface layer of tarnish. Preventing tarnish by using tarnish-inhibiting products in sealed storage is the best long-term solution.

Polishes are abrasive so remove more surface silver than other methods. Multi-purpose metal polishes are even more abrasive than polishes designed for silver so never use them on silver. Gentle rubbing and polishing will minimize damage from abrasive polishing. Do not leave polish containers open or use old polishes because they tend to dry out. When this happens, the fine, abrasive material conglomerates into larger particles making the polishes even more abrasive. Many commercial silver polishes contain ammonia and if polish residue is left trapped in crevices on silver after polishing, the ammonia will dissolve some copper and turn the polish residue green.

Silver polishing cloths are impregnated with an abrasive material. These cloths are gentle because they do not contain the concentration of abrasive particles that would be found in a liquid, paste, or foam polish. Such cloths are most useful for buffing lightly tarnished silver.

Wadding cleaners like Duraglit and Nev-Dull contain an organic solvent instead of water are useful for polishing silver objects that cannot be exposed to water. Be sure to completely remove the residue as possible by rubbing with a soft brush or cloth.

Gentle liquids, pastes, and foams are recommended: Twinkle, Hagerty's and Silvo.

If the object can safely be exposed to water, rinse after polishing and dry completely.

Chemical dips work by dissolving the tarnish on an object at a faster rate than they dissolve the underlying silver. Instructions recommend submerging the object totally but the recommended, safer practice is to apply the dip locally using a cotton swab or cloth then rinsing the object with water. When using dips work in a well-ventilated space and wear rubber gloves. Use dips as little as possible to avoid pitting the metal. Never use chemical dips on objects with sealed hollow components, such as candlesticks and trophies with hollow feet or teapots with hollow handles. Once the dip leaks into the cavity through small holes or imperfections in the joints, it becomes virtually impossible to wash the chemical out.

Do not use this method!

When a silver object is placed in contact with aluminum and both are submerged in a warm solution of baking soda any tarnish on the silver slowly disappears. The process is electrochemical - reverse

plating. As long as contact is maintained between the two metals the aluminum corrodes and hydrogen gas is produced. This gas reacts with the tarnish reducing it back to silver metal. After using this method rinse the object well to remove any traces of electrolyte. Silver from the tarnish remains on the surface of the object in the form of rough particles that leave a dull, matte finish thus it still has to be polished to make it look good again. Objects cleaned by this method may tarnish more quickly than silver that has been polished. As with chemical dips, this method should not be used to clean objects with sealed hollow components. Objects left unattended can be completely stripped of their plating.

Store silver in a closed cabinet or wrap silver in acid free tissue or silver cloth to store and as moisture accelerates the tarnishing process, put a drying agent, like silica gel, where you store your silver. Activated charcoal placed with your stored silver will absorb acidic airborne pollutants that can damage silver. Silver cloth is impregnated with microscopic particles of silver or zinc. The metal particles in the cloth attract and absorb sulfur compounds before they can reach the silver item being stored. In a tight-fitting storage chest, silver cloth will stay effective for about 20 years before it becomes saturated. Silver cloth, a flannel-like fabric, is sold by the yard to line drawers and chests or to make silver storage bags and wraps.

Some things should not be used to store silver:

- newspaper and rubber bands should be avoided because they contain sulfur compounds
- plastic food wrap contains chemicals that can damage silver and over time may adhere so tightly that you'd need strong solvents to remove it
- ordinary cardboard boxes contain acids that aggressively attack silver. Only acid-free archival boxes should be used to store silverware.

Basketry

Baskets, mats, woven hats and similar objects composed of plant materials were originally made to be used every day and as a result, are often weak and brittle. Although they may appear to be durable, they can easily be damaged. Poor handling is one of the major causes of damage to basketry. Never lift baskets by the rims or handles. Basketry should be displayed in as low a light level as possible as most dyed elements are particularly light-sensitive.

Cleaning is an irreversible process so care must be taken to remove only what is necessary. Dust can be abrasive and, depending on its components, can react with moisture to accelerate chemical degradation or provide nutrition for insects and mould. Dust is also be unsightly, hides surface detail, and become increasingly difficult to remove the longer it is allowed to accumulate. What appears as dirt may be evidence of previous use. Deposits such as seeds, berry stains, etc. are part of the object's history of use and should not be removed.

Begin by placing the object on a clean table. With a soft brush, gently dislodge dust and debris, directing it toward a vacuum cleaner nozzle. Disfiguring surface dirt that cannot be removed with a brush and vacuum can possibly be reduced with a sponge-like rubber eraser.

Wooden furniture

Unfinished wood

Cleaning bare wood surfaces is complicated by several factors:

- wood is relatively soft and can be damaged by some cleaning techniques
- wood degrades with time and use, so older wood surfaces may be even softer than new ones
- wood surfaces may include natural deterioration products and traces of substances that were applied or came in contact with the surface when the item was in use, *patina*, the look of age that gives well-maintained antiques their value.

Before attempting to clean a wood surface it's important to differentiate between dirt, which should be removed, and patina, which is desirable and should not.

Most objects with firm stable surfaces can be safely cleaned with a soft paintbrush and vacuum cleaner. Brush the dust from the surface into a vacuum cleaner nozzle that is covered with cheesecloth held in place with a rubber band (this will prevent small pieces being accidentally sucked up. If the surface is in good condition, a stiff bristle brush may be used to remove ingrained dirt.

Finished wood

The finish of a piece of wooden furniture refers to the surface of the wood and how it may have been changed cosmetically by the builder or altered through later use. The finish is a discrete coating that keeps the wood beneath from being soiled. Half the value of a piece of furniture resides in its finish, so maintaining it has economic as well as historical and aesthetic benefits.

Furniture finishes are often assumed to be some type of varnish, but in fact many materials can be used. There are five basic categories of finishes:

Paint - pigments for colour with a binder such as a drying oil, resin or synthetic polymer. Paint finishes in good condition be safely cleaned with a damp cloth, a process that is closer to damp dusting than washing. Test a small area, if no trace of colour comes off it is safe to proceed. Varsol or mineral spirits are also options for cleaning painted surfaces in good condition and will remove wax and dirt. Spot test with a cotton swab. If after several minutes no trace of colour comes off proceed with a soft cloth dampened with the solvent and proceed as above, replacing cloths as they become dirty. Paint thinners give off fumes, so be sure to work in a well-ventilated area or outdoors.

Clear finishes - lacquers and varnishes that may include pigments or dyes to modify the colour of the surface and that differ from paints only in being transparent. Transparent coatings that have a 'wetting' effect that enhances the natural colours and patterns of wood. Varnishes and lacquers form a complete film on wooden objects and are susceptible to cracking and loosening as the wood expands and contracts. Exposure to light leads to slow and insidious degradation that eventually causes the finish to turn yellow, crack and become loose. Water produces rapid and obvious damage so use coasters and be careful not to overwater plant pots resting on lacquered or varnished surfaces. Intact lacquered or varnished surfaces are quite durable, and can be cleaned in the same way as painted surfaces.

Oil - drying or non-drying oils can be applied to wooden objects to saturate the colours and add a measure of protection. The most common of the traditional was linseed oil, but tung oil was also

used, especially on wood furniture produced in the Orient. Linseed oil provides a lovely yellow colour to light woods but in time it turns darker woods almost black. Cleaning oiled surfaces should be limited to damp cleaning or cleaning with mineral spirits.

Wax - bare surfaces of some wooden objects are treated with wax and are maintained during use with further coats of wax. Wax coatings that have built up around hardware and other less accessible areas can be removed with an orange stick like the kind used for manicures. Old wax can be made more soluble by soaking it with mineral spirits. If the whole surface of the piece has been heavily waxed, this method can be used to clean the entire object as described above. Rewaxing should be done with a soft, lint-free cloth, using a furniture paste wax that is free from colorants and perfumes. Apply the wax thinly and evenly and rub it in well. After the wax has dried to a matte appearance, buff it vigorously with a clean cloth making sure to work well into less accessible areas. Wax polishing should not be done frequently; a thorough waxing will last for many years with only an occasional buff with a pure cotton cloth.

Dry pigment – natural earth pigments like chalk paint, ochres and umbers, wood ash or white clay applied in a slurry. Even light brushing to remove dust can loosen the pigment so protection is the best idea.

Rubber and Plastic

Natural and synthetic rubber and plastic deteriorate continuously. Deterioration may be chemical, caused by oxidation (exposure to contaminants in the air) or hydrolysis (humidity); physical, or biological and results in changes in the chemical composition, physical properties and appearance of these materials. Vapours harmful to other objects may be released and exudations (the surface becomes sticky or oily) or accretions (compounds within the rubber or plastic migrate and form on the surface) may appear on the surfaces of plastic and rubber objects.

Rubber may become brittle, hard or cracked; it may soften and become spongy or sticky. Plastics may lose strength, and, at the same time, become brittle, crack and shrink with age. Old plastics are more at risk than new ones because plastics produced more recently benefit from the increased use of stabilizing additives, and the increased understanding of the chemistry of plastic degradation.

Heat, light, exposure to oxygen and atmospheric pollutants and humidity all affect the rate at which plastic and rubber deteriorate so they should be stored in cold, dark, dry and oxygen-free conditions. Cold, dark, dry conditions can be found in the refrigerator section of a frost-free refrigerator or in a low relative humidity cold storage room. The freezer compartment of frost-free refrigerators and frost-free deep freezers have high relative humidity and should not be used to store objects, unless they are protected by sealed glass or vapour-proof plastic containers along with dry indicating silica gel that occupies about one-third of the air space in the container.

Because degraded rubber objects may become sticky and adhere firmly to materials they are in contact with, they should not be allowed to touch one another or other objects.

Do not use solvents or even water-based cleaning solutions on rubber and plastics; clean objects under dry conditions by careful brushing or vacuum cleaning.

Textiles

Before placing a textile into storage, examine it thoroughly for any sign of insect infestation or mould. If either of these conditions is detected, place infested textile in a sealed, clean, polyethylene bag and isolate them.

Mould – Put the plastic bag in freezer to halt any action. If the object can be laundered or washed, do so. If not, thoroughly dry the object then clean it with a soft brush, gently sweeping the mould toward the suction pipe of the vacuum cleaner. Textiles that are in a very fragile condition can be safely surface cleaned by gentle brushing and by vacuuming through a screen. Wear a facemask.

Insect - If a pest infestation is found, place the sealed bag into the freezer for a minimum of 72 hours. If the object can be laundered or washed, do so. If not, thoroughly dry the object then clean it with a soft brush, gently sweep the mould toward the suction pipe of the vacuum cleaner. Textiles that are in a very fragile condition can be safely surface cleaned by gentle brushing and by vacuuming through a screen.

Remove the textile from any paper wrappings other than acid-free tissue, especially coloured paper from which dyes could transfer. Remove pins and staples; these put stress on the fabric and are almost certain to rust. Isolate any metal fasteners by covering them with acid-free tissue or with clean white cotton to prevent them transferring rust marks to the textile.

Textiles should be clean when stored as soil invites infestation and sweat and oils produced by c.

Hanging

To hang textiles use padded wooden or plastic hangers that have been cut to size if necessary. The aim is to support the garment to minimize stress on the fabric. Do not use lightweight wire hangers - they do not provide adequate support. Pad the hanger with polyester or cotton quilt batting to round it to a wide and cushioned form with no sharp edges. This will allow the weight of the garment to be evenly distributed over the shoulder area. Then sew a prewashed cotton cover over the padded hanger.

Skirts and pants in sound condition can also be hung for storage. Always suspend these garments from the waist. A wooden clamping hanger can be adapted for this purpose by lining the insides of the hanger with polyethylene foam or batting secured to the hanger with hot melt glue then adhere white felt or a white velvet ribbon with hot melt glue over the cushioning layer to reduce slippage.

Give heavy, bulky or awkward garments additional support from the waist. Lay the garment out flat on a table and insert a specially prepared padded hanger.

- cut two pieces of white cotton tape approximately twice the length from the waistband of the garment to the hook of the hanger.
- sew one end of one length of tape onto one side of the waistband on the inside of the garment. Loop the tape around the hook of the hanger, and bring the other end back to the waistband. Adjust the length, and hand sew the second end into place. Repeat this procedure, sewing the other length of tape onto the other side of the garment's waistband.

If the garment has full sleeves give additional interior support with crumpled acid- tissue paper to fill out folds.

Garment dust covers

For optimum long-term storage garments should be protected from dust, light and contact with other garments by a dust cover. This can be made from inexpensive fabric like unbleached cotton or a prewashed cotton sheet. It is a good idea to wash garment dust covers periodically.

Rolled storage

Rolled storage is an excellent space-saving storage system for flat or two-dimensional textiles that can be rolled. Mailing, paper towel and toilet paper tubes are ideal for smaller items. Larger tubes suitable for quilts or carpets can be obtained free of charge from carpet stores or printers. Slid over a wooden dowel or plastic pipe the tube can be supported by brackets in cupboards or drawers or can be suspended with chains anchored at floor and ceiling. Make sure the rolled textile does not rest on the shelf.

Use a tube longer than the width of the textile with a diameter suitable for the object being stored: a toilet paper tube for narrow lace or a large-diameter carpet tube for heavier objects. You can wrap the outside of the tube with bubble wrap to increase its diameter. Cover the tube completely with acid-free tissue paper or a prewashed cotton sheet to protect the textile from the acidity of the tube. Lay the textile out on a table, making sure that there are no folds or creases. Cover with a single layer of acid-free tissue to interleave as the textile is rolled around the tube. Place the tube parallel to one end of the textile and roll flat textiles onto the tube with the right side face up so that they roll inwards. Roll pieces with a raised texture (pile carpets, velvets, embroideries, etc.) with the right side face down so that the pile appears on the outside of the roll. Roll in the direction of the pile so that it does not become crushed. Two or more people should roll large pieces to maintain a uniform tension. To protect the roll from dust, cover it with a double wrap of tissue or a prewashed cotton sheet. The advantage of using cotton dust covers is that they can be laundered periodically and reused. To secure the outer wrap tie at $\frac{1}{4}$, $\frac{1}{2}$ and $\frac{3}{4}$ with cotton tape or seam binding. The addition of a paper label will help you remember what's rolled inside.

Paintings

The damage or deterioration found on paintings displayed in our homes is usually seen as cracks in the paint, distorted or torn canvas, cracked or split wood, loose or missing paint, or discoloured, darkened or faded surface. These result from a number of factors: poor handling or accident, inappropriate levels or changes in levels of relative humidity and temperature especially if the changes occur quickly or frequently, direct sunlight, the cumulative effect of natural or artificial light and inappropriate or inadequate framing. Sometimes damage can result from an artist's particular use or mix of materials.

Handling is a major contributor of damage to artworks. Moving a painting to a new location can have detrimental effects due to a change in environment. Paintings are especially susceptible to cracking when they are in a dry environment: stored in a dry attic or hung over a heat vent. Extreme cold can also affect paintings; do not transport a painting in an unheated vehicle in cold weather. When you handle or move a painting avoid touching the paint surface or the back of the canvas. Any pressure, even finger pressure, to the back of a canvas can cause cracks in the paint to develop over time.

Try to display your paintings in a place where the relative humidity and temperature levels are fairly constant, not very high (kitchen or bathroom) or very low and where the levels don't change quickly. Rapid environmental changes will occur in locations near an open door or window or in locations directly affected by the airflow from heating/air conditioning vents. The space above a fireplace is normally a display place of honour but it is not the best choice. The environment at the chimney can fluctuate; hot and very dry from the heat and probably sooty as a result of using the fireplace. Do not hang paintings against inside surfaces of exterior walls; these areas are prone to fluctuations in temperature and in relative humidity. If exterior walls must be used consider a backing board or Ethafoam insert to provide insulation between the painting and the wall.

Secure paintings to walls using picture hanging hooks of the appropriate size for the weight of the painting. Hooks are more reliable and do less damage to walls than nails. Using two hooks per painting makes it easier to hang the painting straight and keep it level.

Avoid storing paintings in a damp basement or a dry attic. A better choice is to keep each painting protectively wrapped and sandwiched between two pieces of cardboard or corrugated plastic to protect them from touching nearby objects and stored vertically in a closet in a central area of the house.

Daylight is very high in radiation that is damaging to paintings. Totally avoid this exposure if possible. Watch that there is never any direct sunlight on paintings at any point during the day. Indirect or reflected daylight is better than direct; the further away from the painting, the better. Even "normal" natural or artificial light levels for prolonged periods will cause fading. Directing lights at the painting can cause damaging hot or warm spots on the paint surface. Display your more valued artworks in areas that receive less direct or prolonged light. Fading or colour change can go unnoticed for a while but over time it may become quite noticeable. Light damage cannot be reversed.

The paint surface will, over time, accumulate dust and pollutants, airborne grime from cooking oils, particles from smoking and insect "specks". If displayed in a dining room, a painting may receive accidental splatter. In this case, it may be best to protect a painting by giving it a better location or by using a glass or acrylic sheet in the frame to shield the paint.

The only cleaning you should undertake of a painting without glass is dusting. Any additional cleaning should be left to an expert. When cleaning the glass over artwork never spray cleaner at the glass as it can run down and inside the frame. Instead, spray the cleaner on a clean cloth and wipe the glass.