

A quilt is an art form reflecting the people, culture and technology of its time. A new quilt, as well as one made a century ago, can be ruined by improper care; many quilt owners are concerned about storage, use, cleaning and repair. Decisions about the care of a quilt should be based on an analysis of its components and construction.

## Analyzing Quilts

You should examine a quilt thoroughly before you make decisions about its treatment. In such an examination, you should:
$\square$ Determine the fiber content of the fabrics and batting, if possible. You may identify cotton, silk and wool fibers in older quilts by appearance. Quilts made after the introduction of manmade fibers in 1910 may require different methods of fiber identification. Contact your county Extension home economist for help.
$\square$ Identify the method of construction. Look for hand stitches, machine stitches, pieced squares and appliqued designs. See if layers of your quilt are held together with quilting stitches or with yarn or ribbons tied at intervals. Bed coverings made by either method may be called quilts.
■ Look for loose or missing stitches and weak or frayed fabric, especially around edges and along fold lines.

- Identify decorations such as embroidery, painted designs, metallic yarns, or ink signatures and drawings.
$\square$ Locate soil and stains. A spot with fuzzy edges may indicate that it was made by an oily substance. A water-based spill may have formed a ring. Soils can be caked on the surface. Aged starch may have discolored cotton fabrics. Fold lines often are discolored. Soils and staining materials can attract insects and damage fibers and dyes.

Record your observations and draw a map of
the soil and stain locations. Your analysis will help you make better decisions about the use and treatment of each quilt.

## Storing Quilts

How and where to store your quilt can be the most important decision you make. Proper storage areas and safe packing materials help protect your quilt's monetary, aesthetic and sentimental value. The following guidelines can help you decide how to store your quilts safely.

## Storage Areas

Avoid storing soiled quilts. Molds, insects and permanent stains may become problems if soils are not removed. Store your clean quilts in well-ventilated areas that will be dark most of the time to avoid mildew and light damage. Choose areas without extremes or variations in temperature and humidity. Attics, basements and closets along outside walls are poor choices for storage areas. Store quilts within the living space of your home.

## Mapping soil and stain locations



1. Fold lines yellowed
2. Soil along top edge
3. Rust-colored spots
4. Applique stitching missing

You can prevent insect infestation within storage areas by ensuring that your quilts are clean when you store them and that your storage area also is clean. Check regularly for signs of infestation. A persistent insect problem can develop if rodents and insects die within a structure or if deposits of lint and animal hair collect in areas that are difficult to clean. You can control insect infestation by vacuuming contaminated textiles and the storage area. Directions for vacuuming quilts are included in the section "Cleaning Quilts."

The vacuum cleaner dust bag may be contaminated, so discard disposable bags or clean cloth bags immediately. You may choose to use insecticides to control widespread infestation. A number of insecticides available in grocery and department stores are approved for treatment of storage areas in homes. However, paradichlorobenzene, the component in most moth crystals and mothballs, has been found to be an animal carcinogen; its use may be unsafe for humans. Read directions carefully for proper and safe use, storage and disposal of insecticides.

Do not store quilts in cedar chests. Unless cedar chests are new, they are ineffective in repelling or killing moths and carpet beetles. Chests and trunks made of wood or lined with paper give off an acid that is harmful to some dyes and fibers, especially cotton and linen. Besides creating an acidic environment, chests limit the air circulation necessary for safe storage. Large shelves and drawers with sealed wood surfaces are better choices.

## Storage Materials

Avoid using plastic bags to store your quilts. Plastic cuts off air circulation and can produce harmful by-products as it ages. Mildew and mold can grow where moisture is trapped inside plastic covers. Additionally, avoid cardboard boxes. The paper acidifies quickly, and the acid can be harmful to dyes and cellulosic fibers. You can purchase acid-free boxes for your more valuable quilts. One to two quilts per box is ideal. Ask your county Extension home economist for a list of companies that sell special storage boxes.

To properly protect your quilts, store them in well-washed sheets or cotton fabric to protect them from dust, light, abrasion and the surface of a storage box, shelf drawer or tube. Launder the sheets yearly to remove dust and the acid that builds up naturally in them. Do not store quilts in pillowcases, because they require too many folds,
and used pillowcases often have an oil buildup that is difficult to remove completely.

## Storage Methods

Refold your quilts frequently to prevent permanent creases and redistribution of batting. Fold quilts off-center in different places to distribute the strain created by folding. Fold as few times as possible. Pad the folds with rolled fabric or crumpled tissue paper. Expensive acidfree paper is unnecessary if the tissue is replaced every year.

Rolling a quilt on a wide tube is an alternative to folding. Cover a tube longer than the quilt's width with several layers of sheeting, and smoothly roll the open quilt around the tube. Do not fold and roll. Roll the quilt top to the inside to protect stitches, but expect wrinkling of the top's fabrics with this method. Alternate the end that rolls on first every 6 months, and use a sheet as a dust cover. You should avoid hanging quilts over a rod for storage. Some museums choose this method because their quilts must be available for people to see, but it causes severe stress along the center of the quilt.

Store your quilts on beds in little-used rooms if the temperature and humidity in the rooms do not vary greatly. Several quilts, one on top of the other, can be stored this way with little stress. Place sheets between the quilts and over the top quilt to protect it from dust and light. Be sure the sun does not shine on quilts stored this way.

## Displaying Quilts

Many quilts were made to be functional showpieces. Do you keep them in storage to protect them, or do you display them to enjoy their beauty and to encourage others to develop an appreciation of their aesthetic qualities and history? Choosing between display and storage may not be an easy decision, but you can safeguard quilts on display in a number of ways.

## Display Areas

Your display area should have little variation in temperature and humidity. Avoid placing a quilt near a heating vent, fireplace, or on an outside wall. Choose rooms that are as free as possible of dust and pollution. Avoid areas close to a kitchen where oily dust and vapors originate and where food is served. Select areas in a room where people and animals will not touch or disturb the
displayed quilts. Choose rooms with incandescent rather than fluorescent lighting. Do not display in direct sunlight. Sunlight and fluorescent tubes give off ultraviolet rays that weaken fibers and fade dyes. Keep light levels low. Light damage cannot be reversed but can be controlled. Vacuum quilts on display regularly to remove dust from the surface. Use the technique described in the section "Cleaning Quilts." The back of the quilt also should be vacuumed if it is displayed vertically on a wall. Check regularly both sides of quilts for signs of insects. If the quilt is made of wool or filled with wool, look frequently for clothes moth and carpet beetle larvae and adults. Clothes moth and carpet beetle eggs can be vacuumed off easily. Pay special attention to creases when vacuuming.

## Display Methods

The method you choose to display your quilt will determine how much it is stressed. Use a bed to display a quilt. The horizontal support will protect the quilt from excess strain. Check for closeness to heating vents and sunlight. When a quilt has to be removed for the bed to be used, fold the quilt in different places, off-center each time. Never tuck a quilt between a mattress and springs. Hang a quilt on a wall to show off its pattern and color, but alternate it with another quilt every 4 to 6 months. Never hang a quilt or label it with adhesive tape. Avoid drapery hooks, nails, tacks and staples that can damage the fabric. The weight of the quilt needs to be distributed evenly. Proper methods for hanging quilts are:

1. Machine-sew the loop side of a Velcro strip to a piece of fabric, and hand-stitch the fabric along the top of the quilt. The Velcro strip should extend across the entire top of the quilt. If a quilt is not quite square, adjust the joining of the strips up or down to allow variation that is difficult to achieve with a casing. The hook side of the strip can be stapled to a board and attached to the wall.
2. Hand-sew a casing along the top of the quilt from side to side with running stitches no shorter than $1 / 4$ inch. Using a single thread, sew two or three rows of stitches at the top and bottom of the casing. Use a double layer of fabric to form the casing so that the rod or slat will not touch the quilt. Attach casing so its outer side is fuller than the underside, creating space for the rod or slat. This diminishes a slanted area at the top of the front surface. Do

not machine-sew the casing to the quilt.
3. Provide additional support for the quilt to be hung by hand-sewing it to a fabric backing. This is safer if the quilt fabric or stitches are weak or if the quilt will be hung a long time, although rotation of several quilts is preferred. Use well-washed and rinsed percale or high thread count muslin sheeting cut on the straight of the grain for the backing. Stitch through the quilt, attaching the backing with loose running stitches that are at least $1 / 4 \mathrm{inch}$. Do not use zigzag or back stitches. Place rows of stitches along the original quilting pattern. Rows may be spaced 12 inches apart on some quilts and closer for others that are weaker or heavier. The weaker the quilt, the closer the rows of stitches should be. Machine sew a casing or Velcro strip along the top of the backing before you attach it to the quilt. Handstitch above and below the casing to stabilize its position.


Hanging with a casing.
4. Support the ends of a rod or dowel that extend out from a casing at the top of a quilt with decorative brackets. If you prefer the rod not to show, two or three screw eyes can be placed through the casing into the dowel with wires extending from the eyes to a picture molding. Another method of attaching a nonvisible support is by using a slat with holes drilled about $3 / 8$ inch from each end. The casing
should end about $1 / 2$ inch short of the quilt's side. The quilt can be temporarily folded back to allow insertion of a screw through the holes in the slat and into the wall.

important. If the quilt is removed from the frame, remove the backing also because the tension on the backing and quilt would have changed since first sewn together.
6. Drape only one quilt at a time over a wooden quilt stand. Often quilt stands have two or three dowels at the top. Wrap polyester batting around all the top dowels several times to create a large padded curve to support a quilt. Cover the batting with fabric and stitch in place. Refold quilts displayed this way weekly and alternate with other quilts frequently.

Padding dowels.


Hanging with less strain.


## Cleaning Quilts

Quilts do not need to be laundered just because they have a musty smell or have been stored or displayed for a long time. Airing and vacuuming are safe for most quilts, but further cleaning can be disastrous. The analysis of your quilt will guide you in choosing safe and effective cleaning methods.

## Airing

A musty odor often can be diminished by airing quilts in well-ventilated rooms or outdoors, away from direct sunlight. To properly air a quilt, you should:
$\square$ Place the quilt on top of a sheet to protect it from the grass, ground or floor. Avoid hanging a quilt over a clothesline. This pulls on the fabric and stitches, causing severe stress along the folded area.
$\square$ Lay a sheet over the quilt to protect it from the sun, blowing leaves, paw prints or bird droppings. Turn the quilt several times as it airs.

Airing, combined with vacuuming, frequently is the only safe treatment for fragile, painted, glazed, or silk quilts. Together the methods may be sufficient for any quilt if no identifiable soil needs to be removed.

## Vacuuming

Shaking quilts to remove dust while airing causes acute stress that can damage fabrics, break stitches, and reposition batting. Vacuuming both sides of a quilt is safer and more effective. Follow these procedures when vacuuming:

- Place a square of fiberglass or nylon screen (available from hardware stores) on the surface of the quilt.
- Vacuum through the screen with the upholstery attachment. The tool can touch the screen, but do not press down. You can decrease the suction if the cleaner has an adjustment or hold the tool at an angle. If you use a hand-held vacuum, be sure dust is not being redistributed onto the quilt surface from the collection bag exhaust.
$\square$ Move the screen until the entire surface on the top and bottom has been vacuumed. Repeat the process, especially if the top of the quilt has been exposed to dust for a long time.
- Avoid vacuuming painted designs that are cracking, peeling, or powdering.


## Dry Cleaning

Dry cleaning solvents help remove oil, grease, paint and tar, but the damage possible from commercial dry cleaning is so serious that this method of cleaning should be chosen only for these soils. A commercial dry cleaning machine uses agitation and spinning like a front-loading washing machine. High heat evaporates the solvent after the agitation cycle. The friction, strain and high temperature can be harmful to quilts and should be avoided unless the soil can be removed only by dry cleaning solvents.

If you have a quilt that is badly soiled with oil, grease, paint, or tar, take it to a reputable full service cleaner who is willing to comply with your requests.
$\square$ Ask the cleaner to prespot the soiled areas. This may be sufficient to remove the soil. If circling results, the quilt will need to be dry cleaned or wet cleaned.
$\square$ Ask the cleaner to use a clean supply of solvent in the dry cleaning machine. Dirty solvent can redeposit more soil than it removes in the batting and on the fabric.
$\square$ Request shortened cycle times and cabinet drying to lessen the strain.
$\square$ Specify that the quilt should not be steamed, pressed or treated with any finishes after cleaning.

Ask that the quilt be rolled on a large diameter tube rather than folded after cleaning.

## Wet Cleaning

Cleaning quilts in water is not easy and can damage a quilt beyond repair. Fibers swell as they absorb water, which can cause damage to fiber, yarn and fabric structures. Quilts become heavier as the water is absorbed, and handling or moving them while wet also strains the fabric and stitches. Wet cleaning offers some benefits, however. Fibers may be less dried-out and more flexible after wet cleaning. Cotton and linen fabrics that have become acidic as a result of the aging process or improper storage can be neutralized. Soils and starches that are harmful may be removed. The appearance of the quilt may be improved by wet cleaning. When creases and fold lines relax in water, a three-dimensional look is restored. Soils and discolorations may be removed or lessened.

The dangers that accompany wet cleaning include dyes that may run into other colors or non-dyed areas, dyes or inks that may dissolve in the water, glazed finishes that may be removed, and strain that may result in damage to the fabric and stitches. Silk quilts or tied bedcovers seldom can be wet cleaned; their dyes may not be fast. Metallic salts added to increase the body of the silk fabrics will dissolve, and the fabric may be too fragile.

You must weigh the advantages against the disadvantages and also consider the amount of soil on each quilt. Does a quilt really need to be wet cleaned? Are noticeable soils present? Would vacuuming and airing freshen a quilt sufficiently without wet cleaning? If you decide that wet cleaning is necessary, the following practices can help make the process more successful and safer.

First, test each color and print by dropping several drops of water near a corner of a colored area. When the water has been absorbed for 1 to 2 minutes, blot with a smooth, white, absorbent material such as blotting paper. If no color appears on the paper, repeat the test several times. Sometimes, discoloration is from soil, not from dyes. Check another less soiled area if this happens. Finally, test the same way with drops of a detergent solution. (Selection of a detergent is discussed later.) If no color shows on the blotter, the dyes probably are fast. Next you should check for weak or damaged areas. For temporary support, sew net or tulle over holes, loose patches or along weak areas. Some damaged areas may need
support fabric sewn on the top and underneath. Use long stitches, and sew through all layers of the quilt with white thread. Do not pull the stitches too tightly. Instead of knots, use several long stitches to secure the thread.

Do not wash quilts in a top-loading washing machine. The agitator pulls on the quilt, surrounding it with enough force to damage both fabric and stitches, even on a gentle cycle. This warning applies to new as well as antique quilts. Use a large frontloading machine only for new and sturdy quilts. The operator of a commercial laundry may agree to launder the quilt in an industrial machine that has controls to adjust for shortened cycles. Remember, though, that washers and dryers cause stress on fabrics and stitches and may dislocate batting.

If you decide to clean your quilt in a bathtub, note that such a method can be hard on the quilt and on your back. The layers in a quilt make sufficient rinsing difficult, but greater danger comes from the increased weight of the quilt after it absorbs water. If you pull on the wet quilt, you can tear fabric and break stitches. Lessen strain in a tub by repositioning the quilt when it is floating in water rather than moving it after the water has drained out. You can lift a wet quilt that has much of the water drained out by placing nylon or fiberglass screening under it and lifting the screen instead of the quilt.

A large basin is a better choice than a bathtub because a quilt can be spread out flat to be wet cleaned. Construct a basin outdoors from four 2 - by 6 -inch boards forming a square or rectangular frame on a concrete driveway or on a large table. Line the frame with a sheet of heavy plastic to create a basin. One corner of the frame can be

Wet cleaning in a homemade frame.

hinged to open and allow the water to run out between washes and rinses. Soiled or stained areas are located easily for special treatment, and sufficient rinsing is more easily accomplished in a large basin than in a bathtub.

Before wetting your quilt, remember to check dye fastness, support holes or damaged areas, and vacuum both sides thoroughly. Grease, wax, paint, tar, chewing gum, adhesive tape and stains that may be removed with dry cleaning solvent need to be pretreated. Treat the soiled or stained areas before or after wetting the quilt. Apply detergent solution or detergent and bleach solution to soiled and stained areas with a fresh natural sponge (sold as a facial sponge at cosmetic counters). Use an up-and-down motion, and allow the solution to remain on these areas longer than the rest of the surface. Be aware that using detergent or bleach to treat a stain may clean the fabric surrounding the area being treated, leaving a bigger, cleaner spot on the quilt, and the stain may not change at all.

Choose your detergent carefully. If you do not have to remove much soil, a neutral detergent such as Ensure or Woolite may be adequate. If soiling is light, wet cleaning the quilt may not be necessary. If the quilt is heavily soiled, a heavyduty liquid laundry detergent will be needed. Avoid detergents that contain additives such as bleach, bluing agents, fabric softeners, or enzymes. Do not use soap, a detergent that contains soap (laurate) or a carbonate-built detergent powder because they react with calcium and magnesium from the water or the soil to form an insoluble precipitate. Read detergent labels carefully to determine contents. Measure the detergent and the amount of water with which it is mixed. The amount of detergent in water should be less than 0.5 percent. Five tablespoons of liquid detergent in 4 gallons of water equals about 0.5 percent. A higher concentration makes detergent removal more time-consuming, and the needed extra rinses stress quilts unnecessarily.

Lighten or remove stains and discoloration caused by the aging of starch with bleach. Never use chlorine bleach on older textiles. Safer bleaches are sodium perborate powders - such as Biz Bleach, Clorox 2, or Snowy - and liquid hydrogen peroxide bleaches, such as Snowy or Vivid. The liquids mix with water more easily. A solution half as strong as the directions indicate often works within 15 to 30 minutes. Most dyed fabrics in quilts are unaffected by these bleaches, but you should spot-test them before applying a solution to the entire quilt.

Treat rust stains very carefully. Often the fibers are weakened by the rust and break if agitated. Rust removers available in grocery stores may be harmful to old fabrics and seldom completely remove the stain. Sodium hydrosulfite (Rit Rust Remover) may lighten rust on cotton or linen but should not be used on silk or wool. Check dye reaction before using it on dyed fabric. Think of rust as part of a quilt's history.

Consider the water purity before cleaning your quilt. If you or a friend has a home water softener, use softened water; otherwise, use your regular water unless it has a high iron content. Using distilled or deionized water is too expensive for large textiles. Attach a hose to a water supply that furnishes hot and cold water. The warmer the water, the better the detergent cleans. Cotton quilts can be cleaned in water as hot as your hand finds comfortable if the spot tests indicate the dyes were fast in warm water. Do not allow wash water to cool too much before replacing it to prevent redeposition of soils. Lower the water temperature gradually with each successive rinse.

Begin your wet cleaning outdoors early on a hot summer day so the quilt will dry as much as possible before evening. Presoak the quilt in warm water first; discoloration may lighten sufficiently using water alone. Wrinkles and folds often disappear in the presoak. Quilts with dyes that are fast in water but not in detergent solution may be improved with one or more clear water soaks. Change the water when it becomes discolored or cools off.

Fill the basin with detergent solution to soak and sponge the quilt or apply detergent, and possibly bleach, with a sponge to the wet fabric surfaces without water in the basin. Limit agitation to an up-and-down motion with your open hands or sponge, gently pressing down and lifting up to move the water through the fabric. Avoid scrubbing. Since a quilt has batting in the middle, each side of the quilt will have to be treated separately. Rinse the quilt in the basin at least five times after using the detergent or bleach solution. The actual number of rinses depends on the concentration and amount of detergent or bleach used, how much batting is in the quilt and the weight of the fabrics. Agitate by gentle up-anddown hand movements, and let the water from the hose run gently onto the quilt surface for added flushing between rinses. The quilt will float in the water enough for the backside to be rinsed, too.

Note that you should not move a wet quilt unless it is floating in water. You also can turn a quilt over more safely if it is floating. You should
not have to lift the quilt out of the basin. It gets heavy when wet, and the strain from movement can tear fabrics and break stitches. You may have to float a large quilt toward one side of the basin to sponge the center of the quilt, but keep movement to a minimum. Advantages of this method of wet cleaning are that the strain is lessened and the batting does not mat and change position because movement is limited.

Allow the quilt to drain on the plastic sheet with the wooden sides of the basin removed. Blot it with clean, well-rinsed bath towels. Do not use paper towels, which could be acidic. Place bath towels under the edges of the quilt and all around the perimeter to allow water to leave the quilt and evaporate from the towels. Then cover the quilt with a sheet. On a hot day, your quilt may dry in 6 to 8 hours. If the quilt is still damp in the late afternoon, lay it on top of a sheet on an inside floor. Use an oscillating fan to move the air over the quilt. The quilt should dry by morning. Do not fold or roll it on a covered tube until it is completely dry.

## Supporting and Repairing Quilts

If quilts are to be displayed or used, repair damaged areas to prevent further deterioration. This is a simple task but one that probably requires different stitching and repair techniques than you normally use. For instance, do not make repairs with a sewing machine. Instead use all handstitches at least $1 / 4$ inch long. Short stitches create acute stress on just a few yarns, which may not be strong enough to hold the stitch. Longer stitches have more yarns holding the thread in place. Use running stitches; zigzag and back stitches create strain on the fabric.

Stitches will show less if they are taken in the same direction as the warp and filling yarns rather than diagonally. Secure the thread with several long stitches when you begin and end a row of stitches. A knot will pull through a fragile fabric and cause stress on all fabrics.

You may unravel warp yarns from a sheer fabric such as chiffon if the thread needs to be invisible and need not be particularly strong. A single strand of cotton or silk embroidery thread may provide a good color match. Always use new thread but avoid nylon or polyester filament thread, which cuts fabric. Additionally, replace missing applique, piecing or quilting stitches using similar color and size thread as originally used, but with longer stitches.

Cover quilt sections containing frayed or
broken fabrics with a sheer fabric that will prevent further damage but allow the color to show through. Fabrics such as tulle and chiffon can be purchased in bridal departments of fabric stores. Silk or polyester crepeline can be ordered from conservation supply firms. Crepeline comes in various weights and is very sheer. It is suitable to sew over a frayed fabric but not for an area that requires support. Polyester crepeline lasts much longer than silk, comes in a wider assortment of colors, but is more expensive. Cut a sheer overlay the same shape and size as a damaged piece, and baste it on with yarns raveled from the selvage edge of the sheer fabric. Basting stitches should attach the overlay around the edge and through the center. Larger pieces may require several interior rows of stitches. If the overlay is cut on the bias or the outer edge is overcast, turning under a hem on the edges of the fabric is unnecessary. Hems call attention to the protective overlay.

You will need sturdier fabrics to support badly damaged areas of a quilt. Choose a fabric such as percale for a cotton quilt or taffeta or faille for a silk quilt if the quilt has sections of fabric missing and the batting is exposed. If a hole goes entirely through a quilt, attach support fabric on both the top and bottom with long stitches and thread that is appropriate to the weight of the fabric and the strain the quilt will receive. Although some people tend to be purists in selecting support fabrics to match the fiber content of the quilt, the color, texture, design and fabric structure are more important considerations.

If your quilt is missing pieces, consider the final results before deciding to replace those pieces. Leaving the space uncovered and letting the lining show often is preferable to adding an inappropriate fabric from a different period. If you decide to replace missing quilt pieces, choose a replacement fabric with care to avoid drawing attention to the new pieces. Do not remove old, damaged fabric, but place the new piece over it
with longer-than-usual stitches running in and out of the fold along the edges of the patch. Handstitch new binding to worn edges.

## Recording Treatment and Use Information

## Quilt Records

Recording information about a quilt can be helpful to future owners of the quilt when they have to make decisions about its use and care. You may need the information yourself in the future. Start by writing down all you know about the quilt's history.
■ Keep a written record of the tasks you have completed for each quilt, including cleaning or repair. Include the procedures, supplies and materials used. Date the record.
■ Include before-and-after photographs of your quilt if your conservation efforts have made a significant difference in the appearance of the quilt.
■ Record when and where a quilt has been displayed. This record could help you select the next quilt to be displayed if you have a number from which to choose. Update your record regularly. Include pictures of the quilt on display in your home or in a show.

- Do not store the record so the paper is touching the quilt fabric. Attach a note with the record's location to the dust cover.

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