

Set Construction and Prop Crews

The **scene shop** is the stage crew's center of operations; it's the primary workspace for the set construction crew and usually for the prop crew as well, although some large theatres have a separate prop shop. It's the place where drawings become models and models become full-sized sets.

No single shop has every tool and useful feature, but every shop has a basic collection of tools. Most shops have high ceilings and large doors (for moving large pieces of scenery from shop to stage) and a variety of work areas, plus cabinets and storage areas where tools, supplies, and stock sets and props are kept. A scene shop has to be well organized, because it is often bursting with activity.



Set Construction Basics

Despite the endless variations among theatres and the plays they produce, all theatres have certain **stock units**, standard set pieces that can be adapted and used for various purposes. Those pieces include flats, platforms, drops, and props (including furniture). All of these stock units are designed to be easily constructed, moved, and stored.

A **flat** is a light-weight frame covered with canvas, muslin, or wood. Most flats are 2–4 feet wide and 8–12 feet tall. They are usually painted and positioned vertically next to each other to form walls. A **platform** is a set piece with a solid top and braced legs made to support the weight of actors, furniture, and props. A **drop**, or **back-drop**, is a large canvas or muslin curtain that hangs at the back of the stage setting; it can be lighted or painted for special effects.

Flat and platform frames, as well as many props, are often constructed from wood—either stock lumber, such as pine and fir, or sheet goods, such as plywood. Wood is cut and joined in various ways to construct scenery. Before cutting any wood, however, you should measure carefully. An old carpenter's motto says, "Measure twice and cut once."

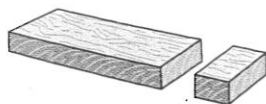
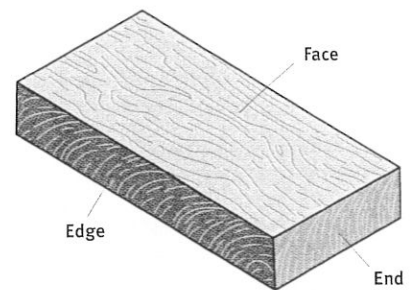
Measuring Wood

Lumber used for construction is referenced by its thickness and width, but the stock size of lumber refers to the rough mill cut and not to the finished dimension of the wood. Thus, a 2×4 piece of lumber really measures about 1½ inches high by 3½ inches wide; these dimensions may also vary slightly from board to board.

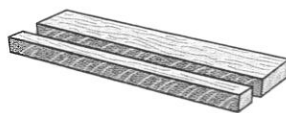
The dimensions of stock lumber and sheet goods correspond to the wood surfaces, referred to by the terms *end*, *edge*, and *face*. The edge and end are of the same thickness, while the face is the surface defining the width.

Saw Cuts and Joints

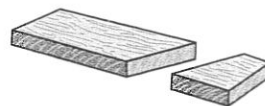
You can cut wood across the grain, which is a **cross cut**; with the grain, which is a **rip cut**; or at an angle, which is a **miter** or **bevel cut**. You can cut all the way through the wood, or part way, depending on how you will join the wood.



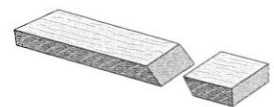
Cross cut



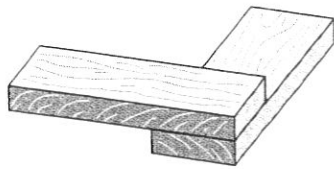
Rip cut



Miter cut



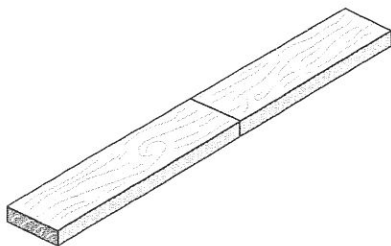
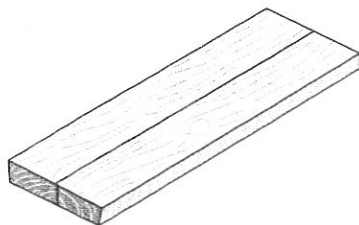
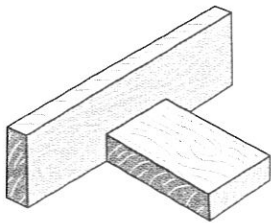
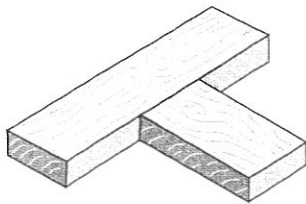
Bevel cut



Lap joint

LAP JOINT In a **lap**, or **overlap**, joint, the face of one board is fastened to the face of another board. Use nails or glue and screws to fasten the boards.

BUTT JOINT A **butt joint** is made when two boards are cut square and joined in one of four ways: end-to-face, end-to-edge, edge-to-edge, or end-to-end. Use nails or glue and screws to join the boards. This is not a very strong joint; it needs some type of reinforcement.

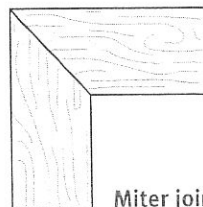


Butt joints

MITER JOINT A **miter joint** is a kind of butt joint in which two boards are cut at an angle and joined. You can use glue and corrugated fasteners, but to make a strong joint, use glue and nails or screws. This joint is often used to make frames that show a nice 90° corner finish or to form corners wider or narrower than 90°.

TECH TIPS: CUTTING AND JOINING

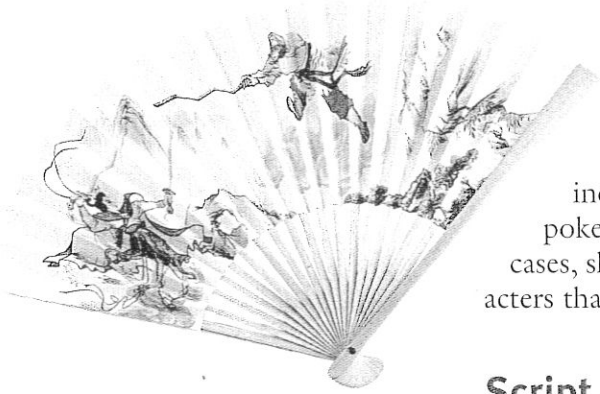
- When measuring wood to be joined, it may be necessary to subtract the thickness of the wood from the finished dimension before cutting.
- Draw a pencil line to mark the place where you want to make a cut. Then make sure you save, or cut on the outside of, the line. If you cut on the line you drew, you will lose up to $\frac{1}{8}$ inch of your board.
- To guide a hand saw while cutting, keep it vertical. Keep your index finger outside the handhold and pointed at your line. Use light pressure only; using heavy pressure may cause the saw to bind, or catch, and spring out of the cut.
- Circular saws cut upward, so they may splinter the top of your board. Always put the good side face down before using a circular saw.
- A common way to join boards is to **toenail**. When you do this, you drive the nail on a 60° angle from the first board down into the second board.
- Avoid placing nails in a row along the edge of a board; that can create a split in the wood. Use two nails on the end of a board.
- Unless you are using a power hand drill to drive your screws, use a hand drill to make a starter hole into materials you plan to screw together. The starter hole should be about the diameter of the shaft of the screw without its flanges (spiral ribs).



Miter joint

Prop Design and Construction

The set you create communicates the time, place, and mood of a production. The props offer specific clues about the characters in a play and the world they inhabit. **Set props**, such as furniture, appliances, lamps, and rugs, help establish the play's era and the financial status of the main characters. **Decorative props**, such as curtains, pictures, linens, knickknacks, and magazines, offer clues about lifestyle. They also convey both the period and the personalities of the characters who own them. The addition of such items to the set is known as **decorating** the set. **Hand props** are props used by the characters during the performance. Depending on the play, they may include items such as a book, telephone, letter, fan, fireplace poker, gavel, and bottle. They should be usable and in most cases, should suggest the personality traits and lifestyle of the characters that use them.



Script Analysis for the Prop Master

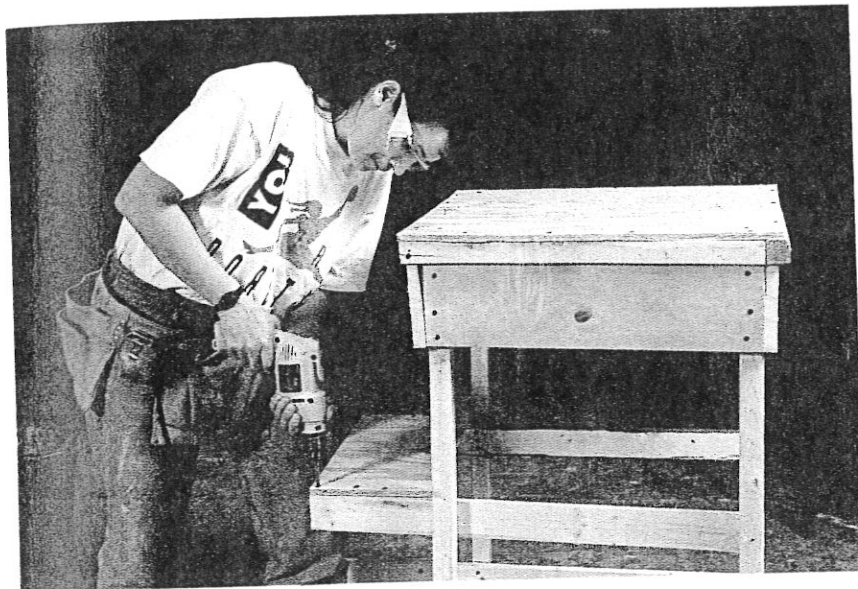
The prop master must research the period in which the play is set, the society the play is about, and the conditions under which the action will take place. This information will be important once the prop crew sets out to create or acquire the props. The prop crew must understand the use of the prop in the play and other requirements, such as color, time period, and style. You can't simply request an alarm clock if the play calls for an old-fashioned wind-up alarm clock or you might get a modern electric clock-radio. Getting the right props requires careful analysis and a well-prepared, specific prop list.



Prop Plot

Often a play script includes a prop list citing all the necessary props as defined by the playwright. Consult this list and the script to create a **prop plot**, a list of props needed for each scene. Using your prop plot, you can begin gathering and organizing the props the play requires. Denote items that can be **pulled**, or taken from stock, and whether they need to be modified, as well as those that need to be rented, bought, borrowed, or built. Specific requirements for the prop should be noted on your plot. Members of the prop crew should have specific assignments for acquiring or fabricating props to ensure that all are accounted for.

Note that because props suffer heavy, repeated use, borrowing is risky business. Never borrow an item your theatre can't afford to pay for if something should happen to it.



Prop Construction

Large set props, such as thrones or beds, are often constructed by the set construction crew. Smaller set props may be pulled from stock or acquired from thrift stores or garage sales. Tables and wooden chairs can get a new look with the simple application of paint. Sofas and chairs can be reupholstered. A lamp can get a new shade.

For curtains and draperies, you can use inexpensive fabrics such as corduroy and velveteen to simulate lush fabrics like velvet and silk. Chiffon or netting can serve to make sheers. Choose ties and valances that suggest the period you want to depict.

The simplest way to obtain hand props is to buy them and adapt them for your particular production. Those that are difficult to find may be fabricated with papier mâché, plaster, or other materials.

The Prop Table

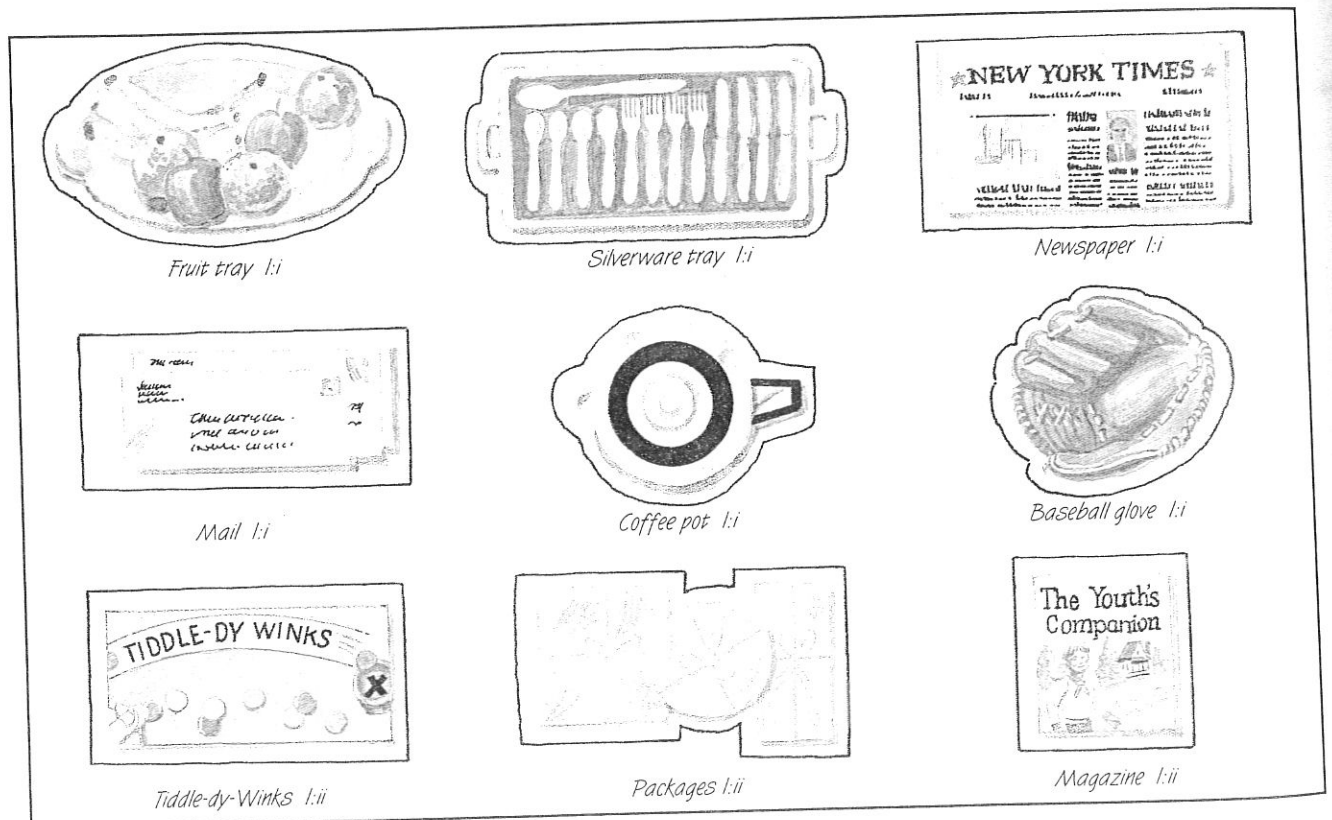
Like the prop crew, actors who carry props on- or offstage must return each prop to its assigned location. To make offstage placement simple and convenient, you will probably want to set up a prop table. Make sure props are returned to the same part of the prop table each time they are used. If an actor has an unusually quick entrance and exit, station a member of the prop crew offstage to take the prop and put it in its proper place. The prop crew must make sure that the props are on the right side of the stage where they will be carried on by the actors.

During rehearsals, you should practice setting props quickly in the proper locations. Once you have your movements down, coordinate scene changes with the shifting crew. Try mapping out alternative shifting and prop crew movements on paper so that each crew can ultimately make one sweep of the stage.

MAKING A PROP TABLE

1. Cover a large table with butcher paper. Tape it down.
2. Set the props on the table, organized according to scene or character use.
3. Draw an outline around each prop. Write a label identifying the prop that belongs in that space.
4. In the space, write the act and scene in which the prop will be used.

Prop table for *Life with Father* by Howard Lindsay and Russel Crouse



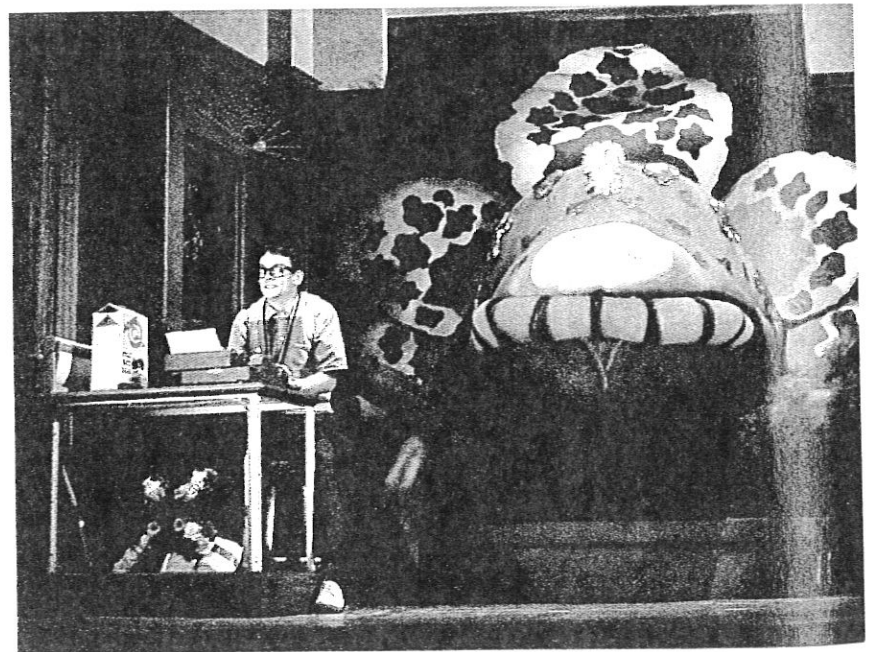
The ever-expanding range of craft materials and techniques to create special effects increases the creative possibilities for prop construction; however, some materials have been in use for generations and are still proving themselves useful and flexible.

A time-tested and popular technique for creating all kinds of props—set, hand, or decorative—is **papier mâché** (pā'pər mə shā'). This inexpensive technique requires wire to make a form, newspaper torn into strips, and a paste-like mixture to coat the newspaper and serve as a binding agent. This is the technique commonly used in the process of constructing three-dimensional scenery (p. 465).

Several recipes are in use for papier mâché paste. One popular recipe is to mix wheat paste or flour with water until it's the consistency of a thick soup. While this is effective, the flour mixture can sour quickly. In addition, papier mâché items made with this mixture should be stored carefully in sealed plastic containers because they attract rodents and other pests. Powdered wallpaper paste or white glue thinned with water both work well and don't have the drawbacks of the flour-and-water paste.

When working with papier mâché, always use torn strips of newspaper rather than strips cut with a scissors or paper cutter. The torn edges blend better than those that are cut, and the tears follow the grain of the paper, providing a smoother surface.

Little Shop of Horrors by Howard Ashman and Alan Menken features a human-munching plant that grows during the play, requiring several versions of the plant in different sizes. Although this production uses a cloth and fake-fur puppet, you can use papier mâché to create the different-sized versions of the blood-thirsty plant.



USING PAPIER MÂCHÉ

The basic process for papier mâché is as follows:

1. Make a chicken wire form of the object you want, such as a log for a fireplace.
2. Soak each strip of the torn newspaper in the paste mixture. Using your first and second fingers as a squeegee, remove the excess paste. Then apply the newspaper strip over the chicken-wire form of your object. Cover the form completely with a layer of newspaper.
3. Apply three to six layers. If you are applying more than three layers, allow for drying time after the first three are applied. If you are using flour and water, allow each layer to dry before applying the next.
4. Once the papier mâché has dried, you can paint it to look like the object you are replicating. You may wish to lightly sand the surface to even out bumps.

Many craft stores sell a papier mâché product that is a prepared mixture of finely shredded paper and wheat paste. Adding water creates a substance that can be used for sculpture or as a finish coat over rough objects.

Curtains and Drapes

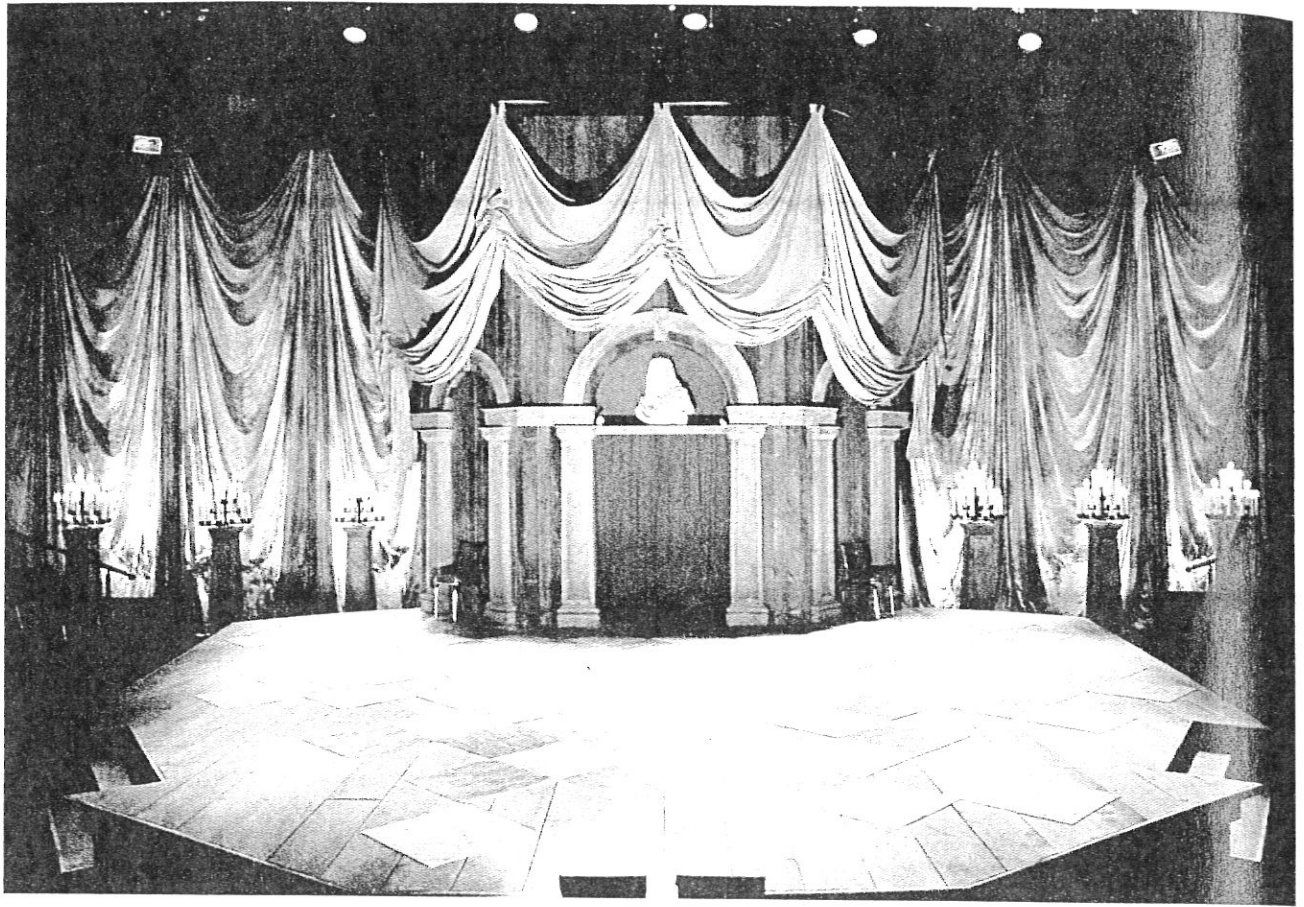
Curtains are typically hung on windows in kitchens and bedrooms; they are often lightweight and semitransparent. They usually cover the length of the window down to the sill but may be a foot or two longer. Draperies, or drapes, are longer and heavier than curtains and are often lined or are thick enough to prevent light from passing through. Living and dining rooms and other formal rooms usually feature drapes.

Curtain and Drapes Fabrics

Fabrics used for curtains and drapes should have a soft, nonreflective surface, be available in many colors, and be flame-retardant. Don't attempt to flameproof material yourself. It's difficult to do successfully, and often, the color will darken in an uneven pattern. Fabric for curtains is relatively inexpensive. Fabric for drapes, however, can be very expensive, but there are inexpensive fabrics that look fine and even luxurious from the perspective of the audience.

Commando cloth, also known as duvetyn, is a cotton fabric resembling felt. It has a variety of scenic uses. The heavyweight variety is appropriate for stage drapes masking backstage areas. The lightweight variety is suitable for set drapes and is a good alternative to velour. Velour is a fine drapery material. It's rich and lustrous and absorbs light well. Narrow-wale or no-wale corduroy makes an excellent substitute for velvet in drapes. Netting, chiffon, and lightweight muslin may be used for sheers, the lightweight fabric that hangs between heavier drapes or curtains.





This set for Molière's *The Miser* displays swagged drapes that reinforce the symmetry and elegance of the entire design.

Curtains and drapes are generally constructed to hang from a rod that rests in hooks on either side of or along the top of a window. A curtain may be hung by passing the rod through a wide seam at the top of the curtain or by fabric ties attached to the curtain and tied over the rod in a decorative fashion. Drapes typically hang on a rod by means of rings or are fitted with drapery hooks that hook over a narrow flat rod.

When constructing drapes for a set, you may want to swag the drapes to give them a more attractive appearance or to recreate a period style. A **swag** is a hanging curve of fabric between two points. There can be one or more swags in a drape. Creating these swags isn't difficult if you measure the distance between the swags rather than try to do it by eye.

SWAGGING DRAPES

1. After you hang the drapes, decide how you want them positioned along the rod, either closed all the way or partially opened.
2. Measure the distance from the rod down to the point where you want the lowest swag to hang.

3. Divide that measurement by the number of swags you want in each drape.
4. Starting at the top of the drape, mark the position where each swag will start with a straight pin.
5. Carefully gather the fabric at each point so the fabric folds over itself.
6. Tie or staple each swag to the set.
7. Arrange the swags so they appear to fall into a natural scalloped pattern.

Bookcases

Many plays call for a set featuring one or more bookcases filled with books, especially if a scene is set in a library. Shelves filled with actual books would be difficult because they would be too heavy to move; luckily, there are several ways to simulate books so the bookcases look real to the audience and are easy to shift.

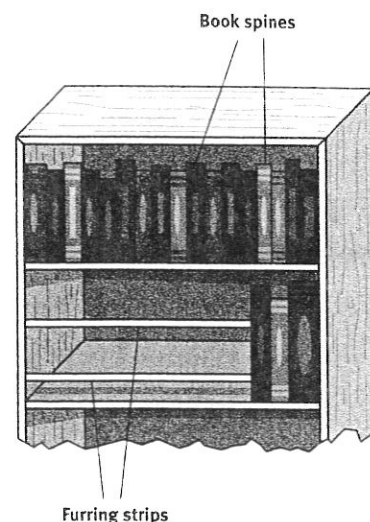
For all techniques, you will need to collect old hardcover books at rummage, garage, or library sales. Using a utility knife, cut the spines—the edge of the book that shows on the shelf—off of the books. If you are using an actual set of bookshelves on the set, you will need to run two furring strips (thin strips of wood) along the bottom and about a third of the way from the top of each shelf. Decide how you want to arrange the “books” on the shelf and then use a hot glue gun to attach the spines to the furring strips.

If you are using a bookshelf that is a nice piece of furniture and you would rather not nail furring strips into it, you can cut a piece of plywood about eight inches high and the length of the shelf or shelves that will hold the books. Glue the spines to one side of the plywood and attach two triangle braces near each end of the other side. Then stand this up on the shelf with the spines facing the audience.

If you are not using an actual bookshelf, you can create the illusion of a bookshelf unit. Cut a sheet of three-quarter inch plywood to the necessary dimensions. Draw lines on the plywood to represent each shelf, and then paint the entire shelving unit, adding any interesting furniture details that the design suggests. Position the spines from the books on the shelves and use hot glue to attach them to the plywood. The whole unit can then be attached to a flat or left freestanding and supported with stage braces.

Stage Food

Stage food poses particular problems for the prop crew. The prop master should study the play carefully to determine whether scenes requiring food can be served by using inedible food instead of edible food, which causes most of the problems.



Edible Stage Food

Edible stage food is required in scenes where the actors need to eat it. Hygiene in handling edible stage food is important: hands and utensils need to be kept clean. Keep packets of moist towelettes or antibacterial hand soap backstage; wash utensils in soap and hot water after every use.

A primary concern is to keep edible stage food fresh. Storing food properly or replenishing it for each performance will keep most nonperishable food fresh (and safe from pests). Ready access to refrigeration is necessary for perishable food; a cooler backstage may serve this purpose during performances. For hot foods, cooking facilities or a microwave may be required. Edible stage food should be warm but never hot. If the script calls for steaming food, a concealed lump of dry ice can provide the look of steam.

Not all stage foods need to be what the audience thinks they are. Squares of white bread can be dusted with cocoa powder to simulate brownies. Toasted and sliced white bread will look like french fries to the audience. Scoops of mashed potatoes can look like ice cream, and adding food coloring can create different flavors. Bread and mashed potatoes can be prepared backstage and are cheaper than the real foods. Cranberry juice can be used for wine (don't use grape juice; the stains on costumes will never come out); apple juice can stand in for beer. Colored glasses can hide liquid, preventing the audience from seeing how much or what is actually in the glass. Avoid using chewy and crumbly foods, such as crackers, because the crumbs get into beards and moustaches and such dry food can cause dry mouth, making it hard for actors to deliver their lines. Milk should never be used because it coats the throat and inhibits vocalizing.

Any spilled food should be cleaned up immediately if it could cause someone to slip; otherwise, it should be taken care of as soon as possible—between scenes or after the rehearsal or performance.

Inedible Stage Food

If no one is going to eat the stage food, of course, it doesn't have to be real; it only has to look real to the audience. Inedible stage food can be made with chicken wire and papier mâché or from a block of urethane foam. Whichever method works best for your play, always start with a picture of the food or with the food itself for a model. If you are using papier mâché, create a form in the shape of the food using the chicken wire. Then cover the form with papier mâché.

If you are using urethane foam, start with a block that is slightly larger than the item you will be creating. Use a wood rasp or a sculpting tool of your choice to shape the foam. When you are finished, cover the object with a thin coat of spackling compound. When the first coat dries, add a second thin coat. When this is dry, sand the object to achieve the desired surface texture.