

VISUAL EFFECT OF STRUCTURAL FORMS

While these elements have been discussed from an engineering standpoint, they have the same effect mentally from an artistic point of view. The character of a piece can change dramatically based on the inclusion or even the suggestion of a structural form.

When you are developing a design, try several variations of a basic form to achieve the affect you want. Thicker elements can look masculine and solid, but if you overdo it, the piece will only look clunky. Gentle curves and thinner parts will look more feminine and refined, but the risk is making a piece that is too fragile to be functional.

Looking at examples from different periods and different styles will show you some methods (or tricks) to integrate the look you want to achieve while maintaining functional and structural integrity. The eye will tend to follow curves and angled lines, and these elements help to add a sense of grace and dignity to the overall form.

A cove or bevel on the bottom edge of a horizontal element, like a tabletop, will reduce the thickness visually. Tapered legs will lighten the look of an object while leaving plenty of material where joints are needed. Open space can also achieve these things. A table with a large overhang on the edge will appear lighter visually although the entire table could, in fact, weigh a ton.

Adding elements can also make a piece appear larger or stronger than it really is. One of my all time favorite pieces of furniture is a glass door bookcase designed by Harvey Ellis and manufactured by Gustav Stickley. The proportions and architectural elements of the piece make it appear monumental, but in actuality it isn't very big. I was sur-

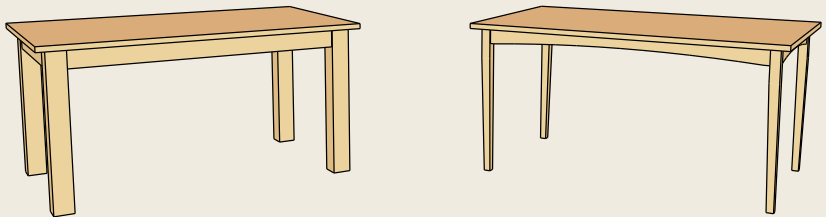


FIG. 4-46 The basic functional and structural elements of these tables is the same, but the style of the individual elements makes a significant difference in appearance.

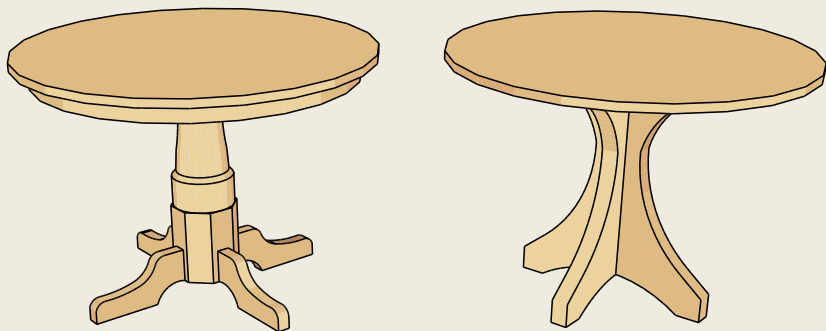


FIG. 4-47 These two tables are nearly identical in overall size and would function equally well. The proportions of the parts create a dramatic difference in the visual appearance and feel of the tables.

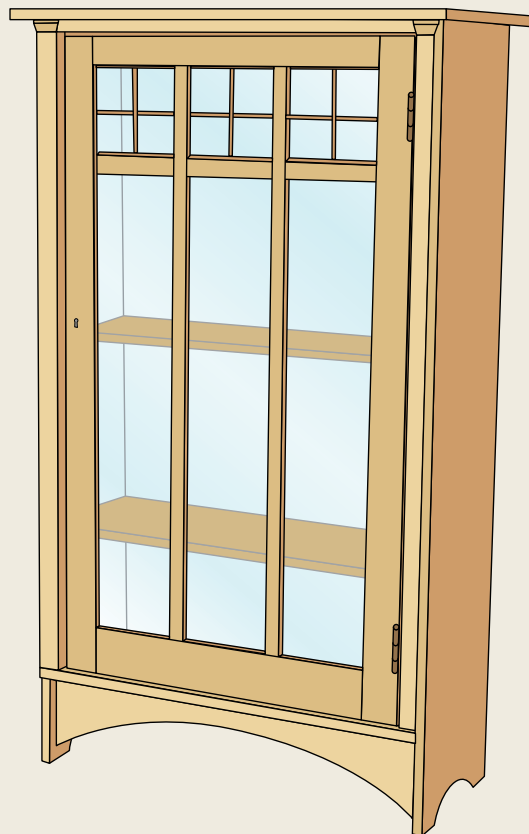


FIG. 4-48 This bookcase breaks many of the standard rules of design, but the overall proportions and details work together for a successful design. Don't be afraid to bend or break the rules.

prised the first time I saw one in real life — it was much smaller than I expected. This combination of visual weight and proportion in a small package makes this an interesting piece to live with. It has characteristics that command attention without being overbearing.

Successful designs, regardless of style will have a combination of proportions, design elements, textures and colors that will get your attention and cause you to linger. And the longer you look more interesting things will be discovered. A function is served, but it is performed with style and grace. Decorative touches may not be needed for the thing to function but they look like they belong.

Bad designs are either boring, don't function well or are bad combinations of elements that live in discord rather than in harmony. Being able to hit the mark with a good design isn't the result of applying formulas or of breaking rules for the sake of being different. It is the result of being intimately familiar with what has been done before and then taking a risk for a good cause.

ERGONOMICS AND STANDARD SIZES

Most types of furniture have evolved into more or less standard sizes. These are best expressed as ranges of sizes rather than strict rules. Functional pieces such as chairs, tables, cases and beds need to hold a certain amount of stuff — one or more people or their possessions — in a certain place or position.

Following strict rules can lead to unimaginative designs, but ignorance of the principles can lead to pieces that may look nice but be impossible or uncomfortable to use. If you go out on a limb to make an artistic point, keep in mind functional needs and historic precedents.

The chances of coming up with something completely new are next to nothing, but the odds of producing a nice variation are pretty good. As long as you don't do something stupid due to ignorance of what has been done before you came along, and decided to be a furniture maker. What follows are ranges of sizes for common items.

Chairs and Tables

I once read a newspaper interview with a traditional Appalachian chair maker. This colorful old guy followed a tradition that goes back hundreds of years, splitting parts from logs, shaping them on a shaving horse and putting them together to make a solid, functional, beautiful and

practical chair. The interviewer asked him "What type of chairs do you make?" His reply was "There ain't but two types, rockin' and settin' and I make 'em both."

The reporter was obviously looking for a thoughtful discussion on styles and forms but I like the man's response. Chairs are one of the oldest, possibly the oldest, types of furniture and the design parameters that have evolved work very well — most of the time. As chairs evolved they also became a status symbol. The throne of the Middle Ages and the Lazy Boy recliner of today have more in common than you might think.

The modern, manufactured dining chair, while not always the best example of construction quality or design elegance, is a good example of what works, most of the time and for most people. Let's start by looking at some of the dimensional constraints.

The first consideration is how far the seat is from the floor. Industry standards are around 18", within a range of 17"-19". This, of course relates to the standard heights of dining tables, which today are between 29" and 30" from the floor to the tabletop.

The drawings show three subtypes of dining chairs, including stools of two heights. The difference in height between the typical dining table and the typical dining chair is 12".

The standard working height for a kitchen counter is 36", so a stool intended to be used in that location should have the seat at 24" off the floor.

Bar tops are commonly 42" above the floor and this is often seen in raised tops intended for dining in kitchens. Again the height difference of 12" is applied and the common barstool has a seat 30" from the floor. These dimensions can vary of course, but straying too far from these standards will lead to an uncomfortable relationship between the sitter and the table.

In fact, some restaurants deliberately design their tables a bit high and their chairs a bit low so people will be uncomfortable after finishing their meal and won't linger. What's good for the restaurant business isn't so good for the furniture maker, so stay close to the 12" difference.

With higher seats, as in stools, the feet need something to rest on. When designing a stool, keep in mind the difference between the seat of a chair and the floor and provide something for the feet to rest on 18" lower than the seat.

One of the measurements critical to comfort in a chair is the distance between the back of the knee and the bottom of the foot. For most people, the standard 18" distance allows the foot to reach the floor with some allow-

FIG. 4-49 The standard height of a dining table is 29"-30" and a typical dining chair has the seat 12" lower.

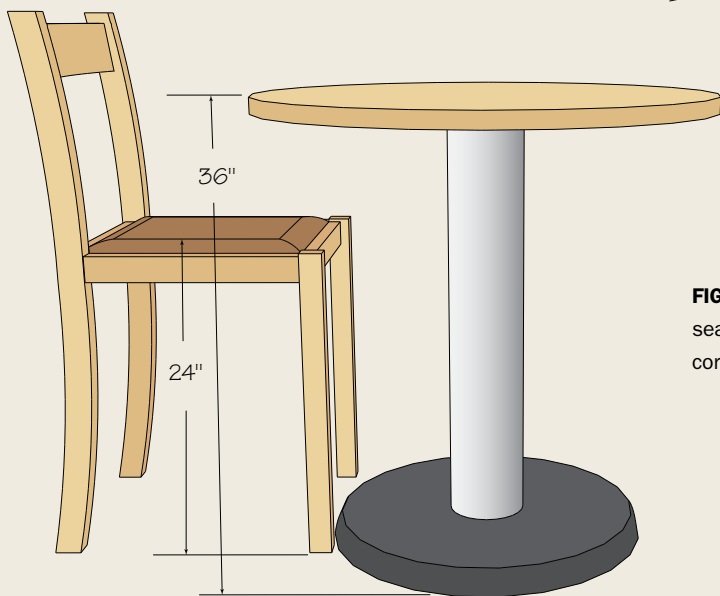
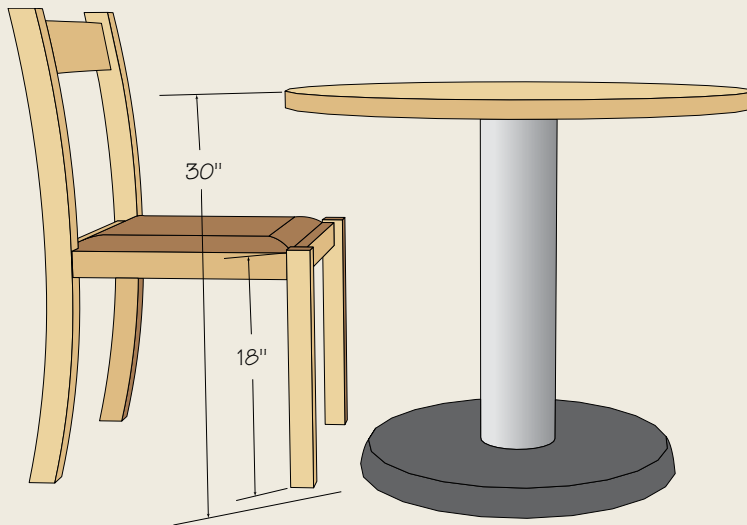
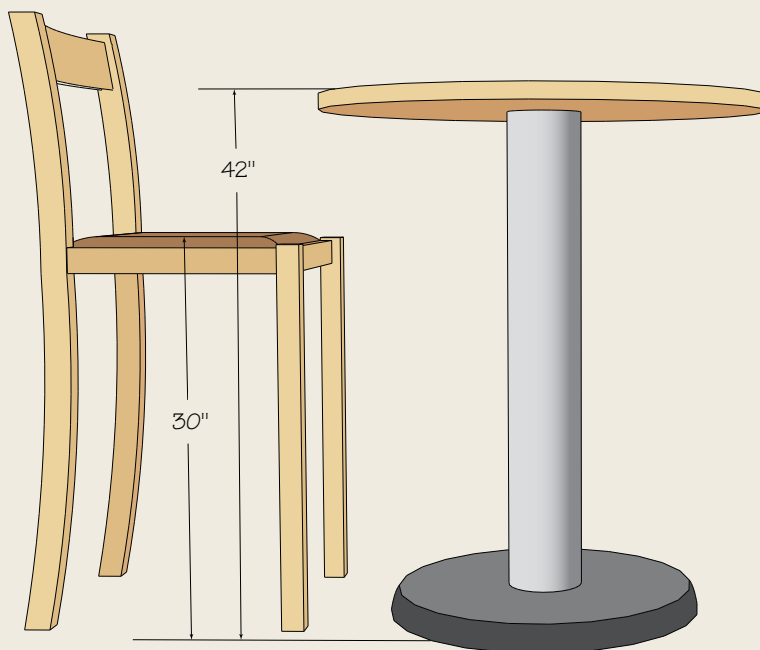


FIG. 4-50 Maintaining the difference between seat height and table height makes a 24" stool correct for use at a 36"-high kitchen counter.

FIG. 4-51 Bar tops are 6" higher (42" above the floor) than kitchen countertops. A 30"-high barstool will make for comfortable seating, but a place should be provided to support the feet.



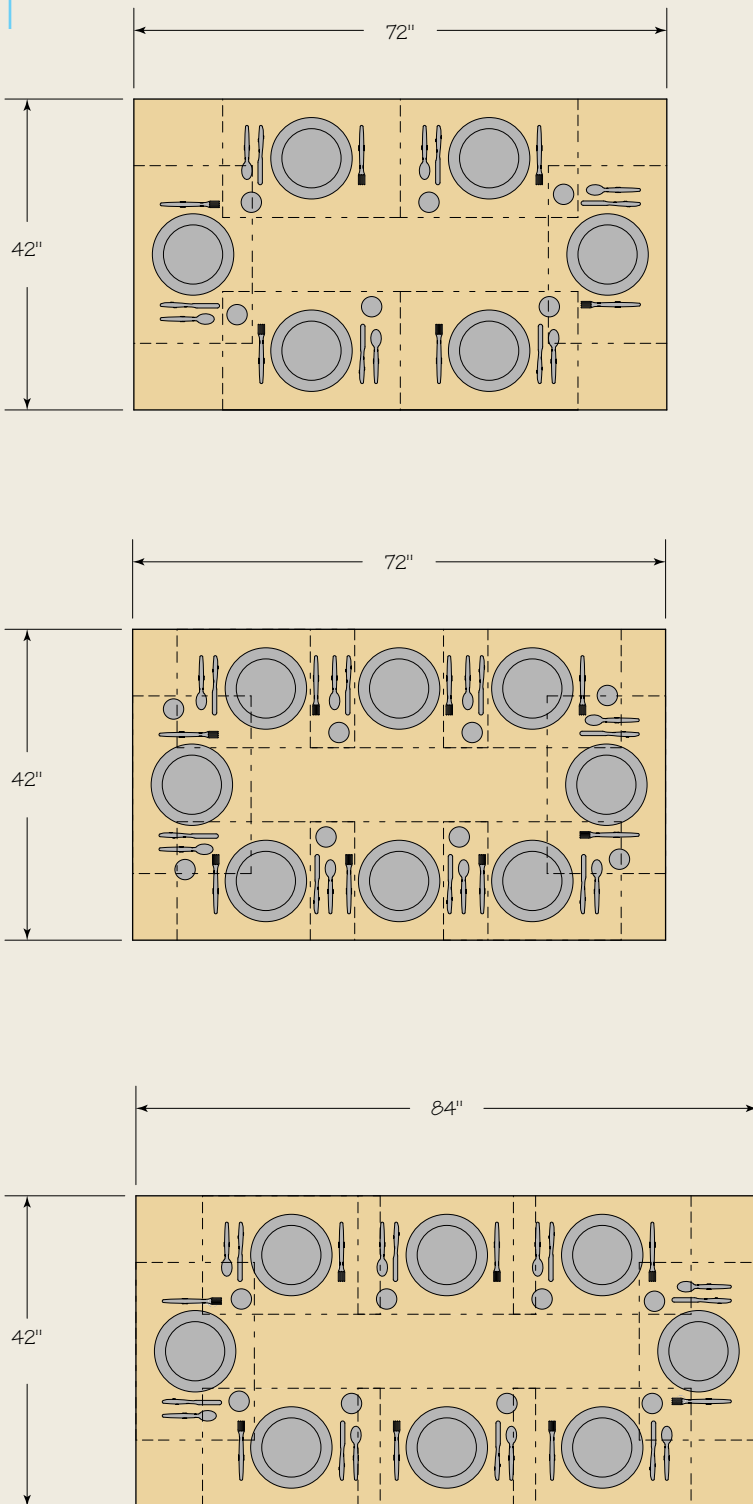


FIG. 4-52 The relationship between diners and each other and between the table and the room should be considered when sizing a table. A narrow width is intimate, but there may not be room for the turkey on Thanksgiving.

ance for shifting position to maintain comfort. If this distance is too high, there will be pressure on the thigh behind the knee, and the weight of the lower leg will be concentrated on this pressure point.

The distance between the knee and the back is of equal importance. The depth of the chair seat should be a bit less than this distance for maximum comfort. The goal is to support the body while giving it some room to shift around. Too little depth on the seat and the weight of the upper body will be concentrated either entirely on the buttocks, or in the muscles on the bottom of the thigh. Too much depth and the sitter's back won't be supported.

The seat shouldn't be perfectly horizontal, it should be lower at the back, angled between one-degree and five degrees. This yields a difference in height from front to back of about $\frac{1}{2}$ " to 1". If a chair has arms, the arms should be located roughly where the elbows fall, a couple of inches above the tops of the thighs or about 6" above the seat.

To further complicate matters, the surfaces of the seat and chair back shouldn't be perfectly flat either. This is an easy way to build, and you might be able to pass it off as minimalist modern design, but flat surfaces will concentrate too much weight on a small portion of the sitter's body. Gentle curves and padded surfaces will spread this weight out.

If you're building the chair for someone with a body close to average, these parameters will be a good starting point. For folks above and below the norm, bear in mind the relation between foot and knee and knee and back and make some adjustments. In any case, chair design really benefits from building a mock-up that can be sat on before making multiples.

Seating at locations away from the table is generally an inch or two lower to the ground; the seat is an inch or two deeper, and the angle of the seat to the floor and the back to the seat up to five degrees more. All of these changes make for more relaxed seating at the expense of easily reaching with the arms.

Having the seat lower to the ground encourages extending the legs. Go too low and you can have a chair that is comfortable once you're

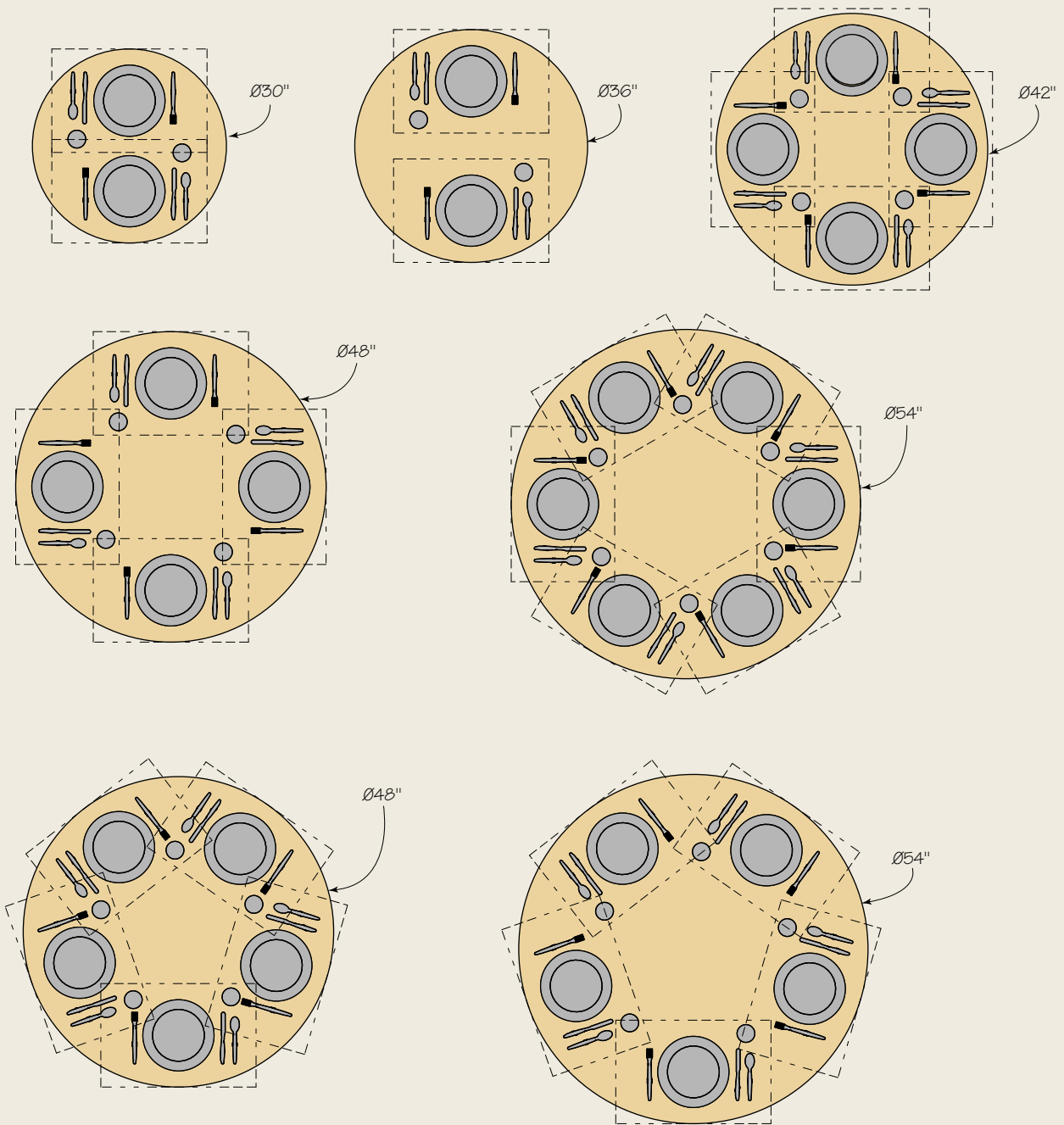


FIG. 4-53 Round dining tables provide more flexibility for seating arrangements than rectangular tables, but there are limits to how many diners can squeeze around the table.

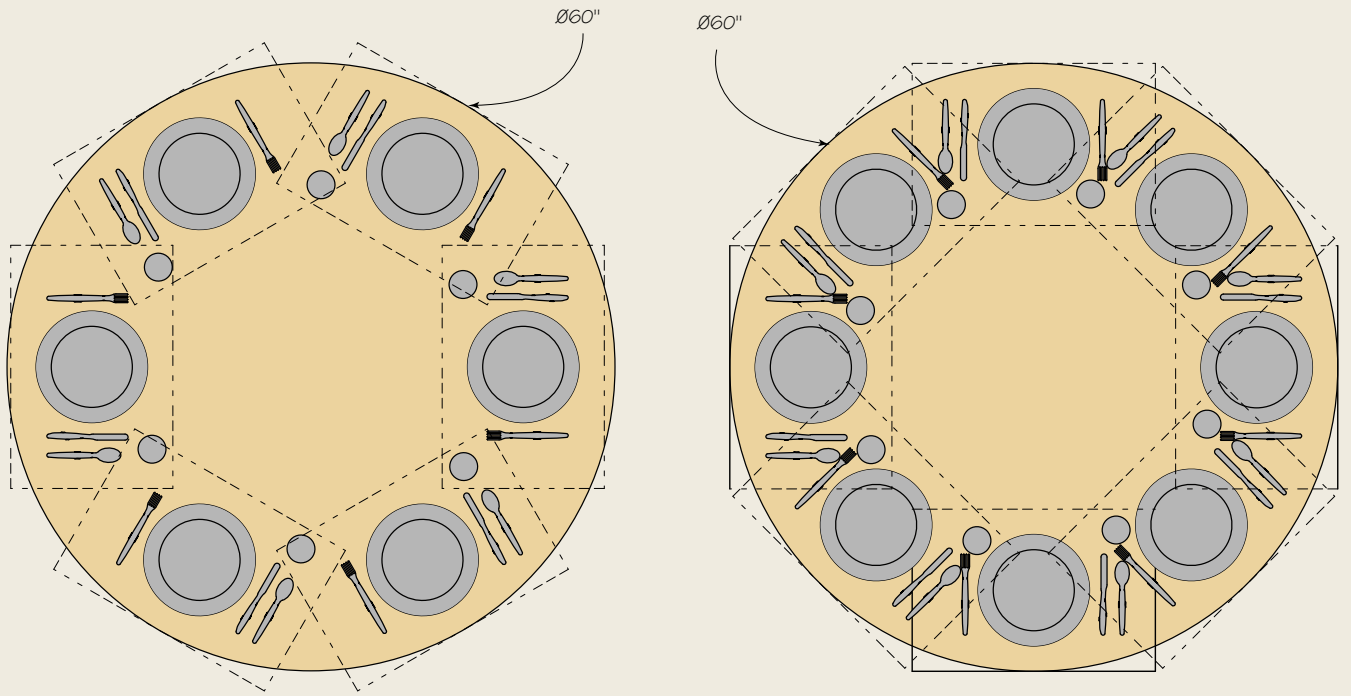


FIG. 4-54 As round tables increase in diameter, the ability to reach across the table becomes an issue.

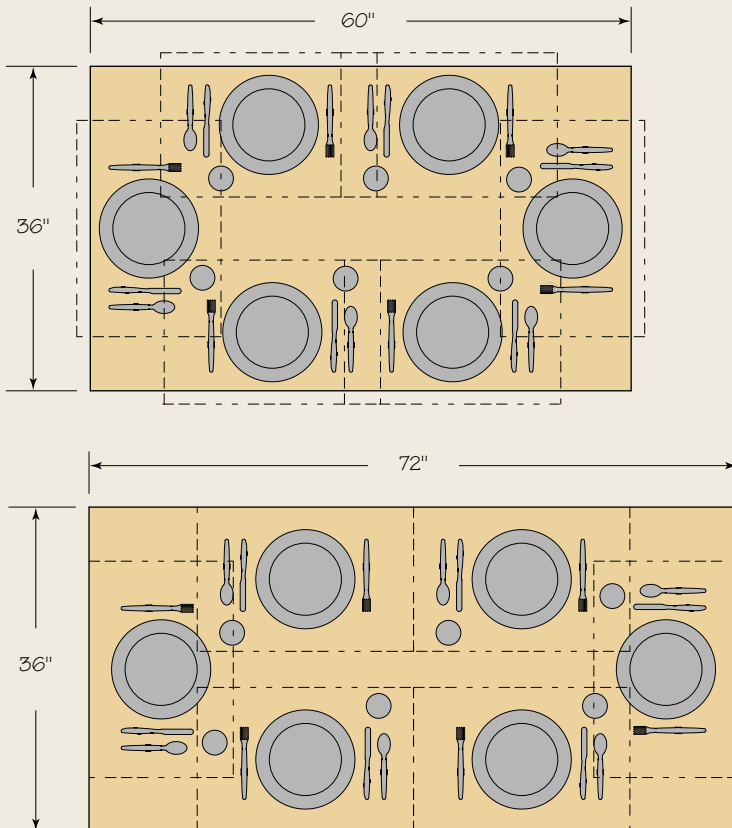


FIG. 4-55 Increasing size must be weighed against a practical increase in seating area. Layout an actual place setting during planning to help find the ideal size.

in it, but nearly impossible for some people to get in or out of.

A rocking chair is also difficult to effectively design without building a prototype. The suggested parameters for seat height, seat angle and back angle still apply and a radius of 36"-42" for the rocker is a reasonable starting point. The trailing edge of the rocker should be far enough behind the chair back so that the chair doesn't tip backwards when rocked.

Tables

Just as chairs were easily categorized on a practical basis, tables can be classified as one of three types: eatin', relaxin' or workin'. Within each of these types there are some design parameters that fall in a narrow range, but other parameters that can vary almost infinitely.

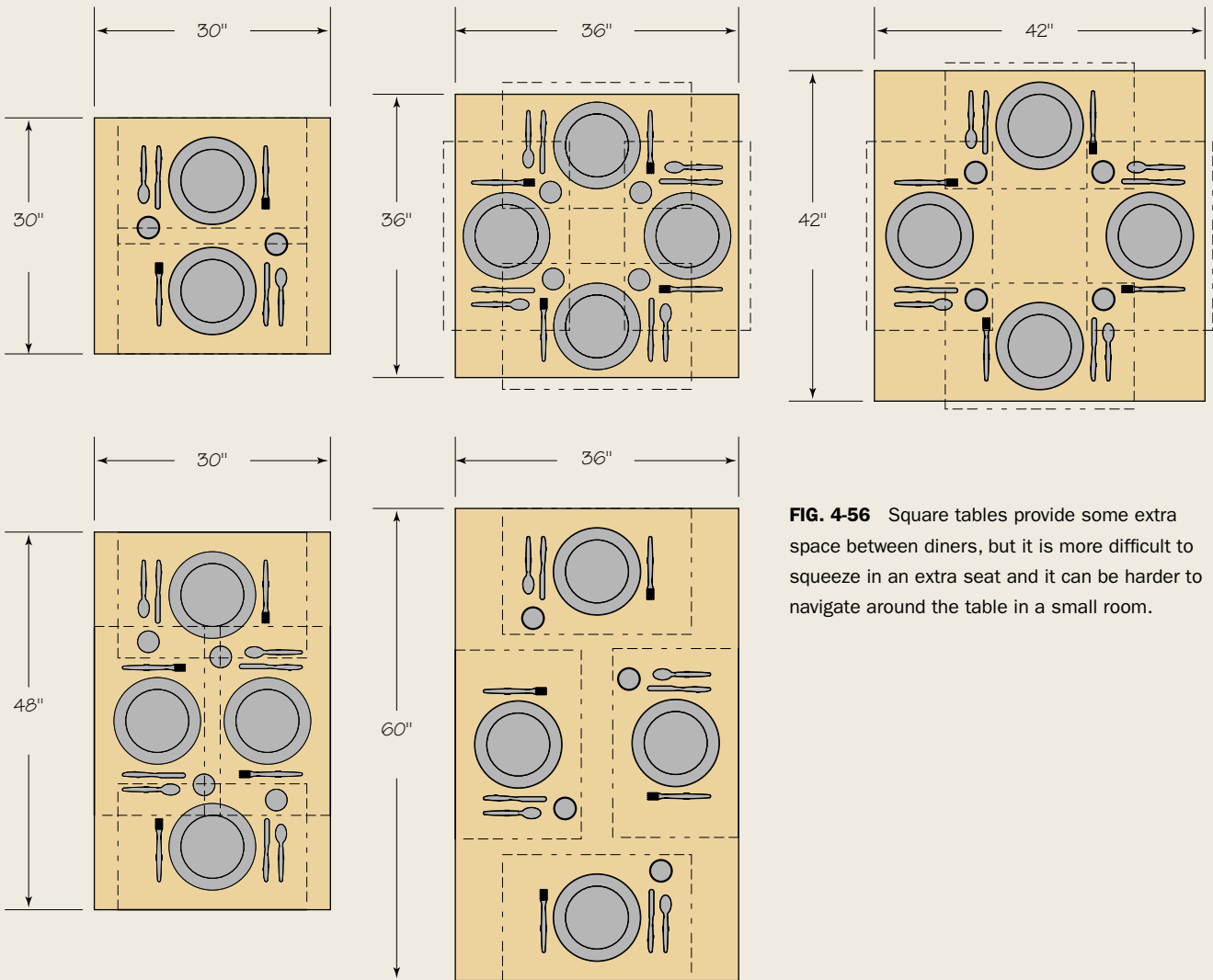


FIG. 4-56 Square tables provide some extra space between diners, but it is more difficult to squeeze in an extra seat and it can be harder to navigate around the table in a small room.

The fixed parameters are those of height, followed by the width and depth needed for the task at hand. For dining tables the standard height is 29" to 30". Each diner needs some room, so the overall size of the table depends on the number of place settings and the size of the room. Shape and overall size can range from a small round table for one to a huge banquet table in a palace.

The illustrations give some examples of typical shapes and sizes and the number of seats that can be placed around the table. In some of the illustrations, there is a "normal" spacing for place settings along with a "crowded" setting. This is a realistic consideration when trying to determine the size of table needed.

Some references have tried to simplify this by making the number of possible place settings a function of the length of the perimeter of the table. This almost works for round tables, but fails miserably when employed for rectangular tables. When you turn a corner, you need to

consider that parts of the available area are width for one diner and depth for the one around the corner.

Also keep in mind the distance across the table. A 30"-wide table will provide a more intimate experience for people across from each other, but there may not be room to place serving dishes and available space at the corners will be limited if you squeeze in an extra seat. A 48"-wide table will give plenty of room for the turkey platter at Thanksgiving but it can be too far to reach across.

Many tables expand for special occasions, so consider both versions in your planning. 18" of expansion is about the minimum for an additional place at each side of the table, but this can be affected by the shape of the top and the location of the leaves in the center.

The location of the legs can also affect the number of available places, as well as the placement of trestles, rails and other structural elements. There may be room on top of the table for two place settings, but will there

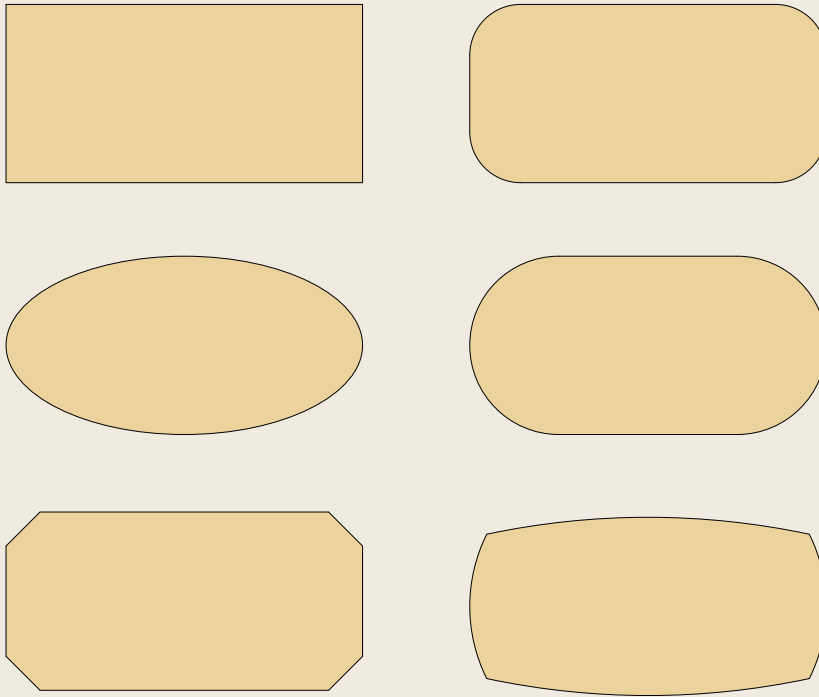


FIG. 4-57 One way to lighten the appearance of a table without sacrificing territory is to alter the corners or the overall shape of the table top.

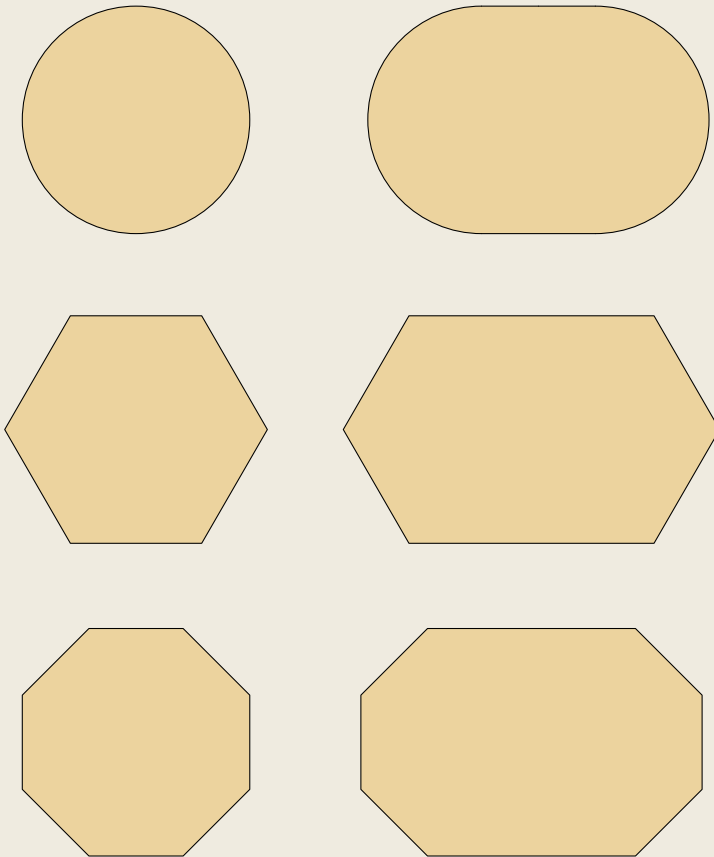


FIG. 4-58 Consider other polygons as well as circles and rectangles to create a more interesting design.

be enough room below for two pairs of human legs? A trestle base close to the end may make a dramatic visual statement but can prevent the end from being used for seating.

And last but not least the size and shape of the room enters into the equation. It's great to have a dining table that can expand to accommodate everyone for a holiday dinner, but if it expands so far that it blocks the door to the kitchen it won't be much of a benefit.

The shapes of most tabletops start as squares or circles, pushed or pulled to a number of alternatives. Clipping the corners of a rectangular top will allow more table width in a narrower room and the space removed at the corner won't be missed. This makes for a more interesting look, and not having a sharp corner makes the table more user-friendly for inattentive people in a crowded room.

Also consider some non-traditional shapes. These can be a practical as well as an esthetic improvement in many cases, but this departure must be balanced to the overall shape of the room. A shape that works in one environment can easily be awkward and non-functional in another.

Occasional tables also have relatively standard sizes, but there is a much wider range within these standards. Coffee or cocktail tables are usually within an inch or so of standard seat heights, 16"-18", but higher or lower tops will also work. It's a balancing act between function and appearance.

End tables are usually between 24" and 30" in height. Often these are matched in height to nearby seating, with the top of the table slightly higher than the arm of an adjacent chair or sofa. Too low and it becomes awkward to reach around the arm of the chair to place or retrieve something from the tabletop. Too high and it begins to feel like you're putting something in the overhead bin on an airliner.

Tables for hallways or for behind sofas are close to the 30" standard height of dining tables, but this can vary to be nearer to the height of the back of a sofa or to accommodate some object on the tabletop.

Desk surfaces are also close to dining table height, but an inch or two lower is often helpful. This encourages and makes sitting upright more comfortable so you can pay attention and get something done. Surfaces for keyboards are lower — 25" to 26" is a reasonable working height.

For work surfaces designed for use in a standing position, start with the standard kitchen counter height of 36" and adjust up or down as needed. This type of surface is best matched to both the task to be performed and the individual user.

In addition to the height of the tabletop above the floor, it is also vital to consider the space immediately below the top. The height of an apron shouldn't intrude into the knee space available when seated.

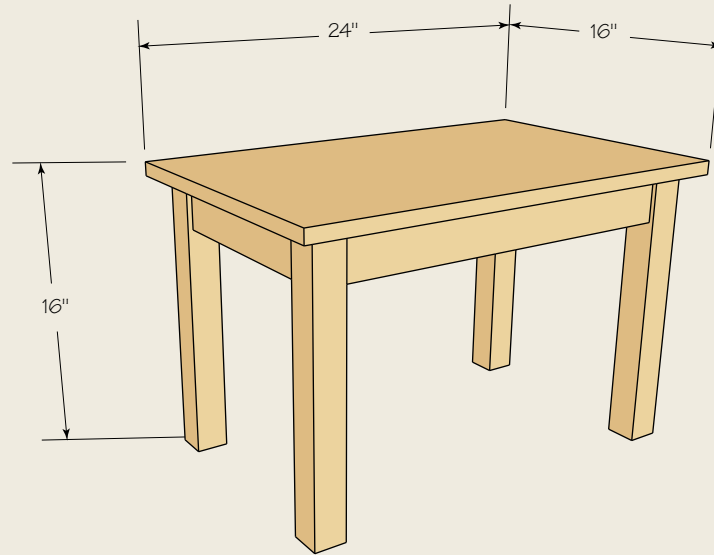


FIG. 4-59 Coffee or cocktail tables didn't exist until the 1920s, so it can be difficult to create a design true to an historic style.

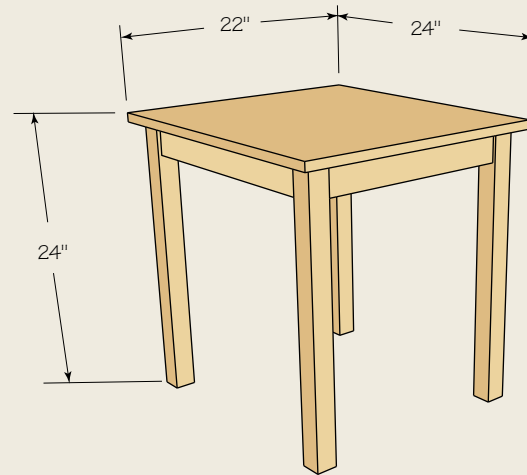


FIG. 4-60 End tables can also be used as night stands and there are endless possible variations. Match the size to the function and placement of the table.

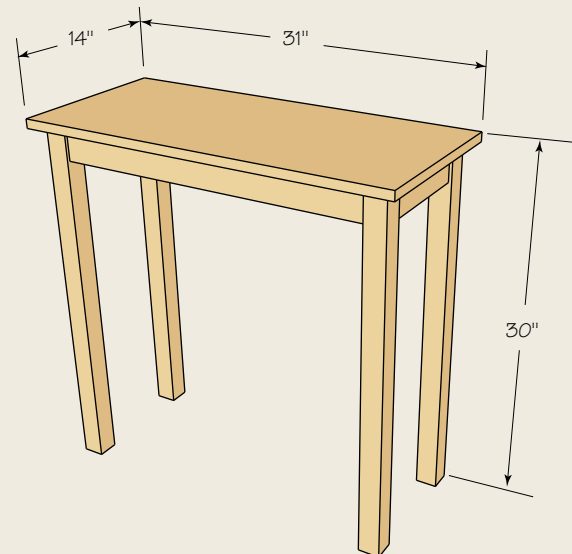


FIG. 4-61 One way to lighten the appearance of a table without sacrificing territory is to alter the corners or the overall shape of the table top.