This circular describes how to design and judge kitchen plans and discusses the ideal placement and use of counters, appliances, drawers, and cabinets.

NEW KITCHENS, NEW DESIGNS
Kitchen design has changed a great deal in recent years. Today sometimes two cooks share meal preparation, creating a need for additional counter space and even an extra sink. Householders also own more kitchen equipment, such as food processors, coffee makers, and microwaves. Finding space for these appliances can be difficult.

While storage space has always been one of the most important ingredients in a successful kitchen plan, providing adequate storage for recycling is a new challenge. Work islands with grills and cooktops complicate the task of providing ventilation. Without a vent fan or hood over the grill or cook-top, keeping the kitchen smoke- and grease-free may be more difficult.

To develop a functional and attractive kitchen, you may need to develop two or more preliminary kitchen plans. How can you compare kitchen plans and decide which cabinet or appliance arrangement works best? While the design is still on the drawing board, evaluate the kitchen systematically. You may discover that the kitchen does not have enough storage, or that appliances are in awkward locations. A rating system, devised by the Building Research Council, to serve as a guide for evaluating kitchen designs can be found on pages 10-14 of this publication.

Kitchen plans can vary enormously. You may have to make compromises in drawer and shelf space, counter space, or in the arrangement of appliances. Compare plans and choose one that is closest to the household’s requirements.

In most cases, you can use stock cabinet dimensions to develop an efficient and workable plan. Dimensions in this circular are based on standard sizes of cabinets and appliances—not on custom cabinets. Custom cabinets allow greater design flexibility, but are more expensive. Even when the budget allows custom cabinets, use the same planning principles to guide the arrangement of appliances and cabinets.

PLANING A KITCHEN
Although each household’s possessions and living habits play a part in how much space is desired in the kitchen, research has established some guidelines for “typical” kitchen sizes. The amount of space in the house places an upper limit on kitchen size. Few people would want a kitchen that takes up half or three-quarters of the house—even if they really like to cook.

Kitchens fall into these categories:

- Minimum
- Medium
- Liberal

To balance people’s ideas about their dream kitchen against the reality of limited house size, home economists have established kitchen standards for “typical” house sizes. The minimum standards are recommended for houses with a floor area of less than 1,000 square feet. The medium standards are for houses with 1,000 to 1,800 square feet and the liberal standards are for houses over 1,800 square feet. Floor area includes the total area for all floors finished as living space. It does not include space in the garage, attic, or unfinished basement.

Four Steps to Kitchen Planning
Follow these four steps when planning a kitchen, and the kitchen will be efficient and comfortable.

Kitchen planning steps:
1. Plan kitchen location and arrangement: Establish the relationship of the kitchen to the rest of the house, and plan the location of windows and doors.
2. Decide on a basic plan: U- or L-shaped, corridor, or one-wall. Check the traffic pattern through the kitchen.
3. Choose suitable space standards: Determine the amount of storage, appliance, counter, and activity space required by the people in the household.
4. Plan for efficient operation: Select the location and relationship of appliances and cabinets. Block these out on the plan, and determine if they are adequate to provide efficient work centers.

Each of these steps is important, and all four must be coordinated to develop a successful kitchen plan.

The information contained in this publication was produced by the School of Architecture—Building Research Council (BRC) at the University of Illinois at Urbana-Champaign. For more information, or a free publications catalog, call 217-333-1801.
Once you have a plan for the kitchen, check the plan by using the scoring system shown on pages 10 through 14. If the check shows too many deficiencies, try rearranging the appliances and cabinets in a different way. In some kitchens moving a door or window will create a more efficient arrangement.

**Good Design Features**

Good design features provide safety, accessibility, and adaptability for a variety of users: children, elderly persons, and persons with disabilities ranging from mobility or vision loss to a weak grasp due to arthritis. Good design covers many aspects of kitchen planning, including clearance spaces and work heights, design of handles and controls, as well as the choice of appliances to minimize contact with hot surfaces. Kitchens with these features will be easier for all people to use throughout their lives. The scoring system at the end of this guide shows the dimensions and modifications needed for good design.

**PLANNING KITCHEN LOCATION**

First, think about the location of the kitchen in the house. The kitchen should be directly connected to the dining area and be easily accessible to the front entrance and the service entrance. Access to an outdoor eating area is also desirable.

If there are young children in the household, the kitchen should be located adjacent to, and have full view of, a play area. Avoid an arrangement that makes the work area the main thoroughfare to the rest of the house.

Individual household preferences will determine whether the kitchen will include space for eating or extra storage. Space for other activities, such as hobbies, laundry, or sewing should be planned at the same time as the kitchen.

**Doorways**

The number of doorways, their location, and the direction of door swing affect kitchen efficiency. In new construction, avoid placing doorways in corners. In older houses, a kitchen designer may have to work around existing door locations. It is also desirable to avoid door swings that conflict with the use of appliances, cabinets, or other doors.

Doors should swing against the side of cabinets, or out of the kitchen. Do not allow doors to swing into the path of travel in hallways or other activity areas. Use sliding or folding doors in spaces with limited clearance.

**Windows**

The number and placement of kitchen windows affect the amount of space available for wall cabinets. Good building practice requires that the minimum glass area of a room equal 10 percent of the floor area. You may wish to increase the window area to 15 percent or 20 percent to take advantage of natural light. However, if the wall with the windows faces north, or the house is in a cold climate, you may want to keep the percentage near the minimum 10 percent level. If the kitchen is part of a dining or family room, the windows need not be in the kitchen work area, but should be at least 10 percent of the total area.

Although daylight makes kitchens more pleasant to work in, obtaining the right balance between daylight and heat loss can be difficult. Skylights are an option to increase natural lighting. In cold climates, select skylights or windows with a high R-value to reduce heat loss.

Where summers are very warm and the window wall faces west, you may want to minimize exposure to the sun. The sun’s rays are hottest in the afternoon when the sun is low over the horizon. West-facing windows will cause the kitchen to overheat if the glass area is large.

**CHOOSING A LAYOUT**

The shapes of well-planned kitchens can vary, but all should have sufficient wall space for appliances and the necessary cabinets and counters.

**Using Space Wisely**

Sometimes the kitchen design is affected by certain fixed dimensions imposed by the plan or structure of the house. For example, the location of a load-bearing wall may set the maximum width or length of the kitchen unless structural
modifications are made. This means that cabinets, counters, and appliances must be arranged to make the best possible use of the available space. Today kitchens are often located next to family rooms, dens, or dining rooms.

**Kitchen Configuration**

The assembly of counters and appliances may take any one of these basic shapes. You can create a comfortable and efficient work space with any of these configurations:

- One-wall kitchen
- L-shaped kitchen
- U-shaped kitchen
- Corridor kitchen

To select the best assembly, determine the space available, and check to see if the cabinets and appliances will fit. If the kitchen opens into another space, the shape may incorporate a peninsula. The kitchen design may also benefit from an island made from freestanding cabinets.

When space is tight, a one-wall kitchen can be an appropriate option. However, for kitchens with medium or liberal standards, the distance between appliances in a one-wall kitchen could require the cook to do more walking.

The L-shaped kitchen, which allows space for a dining area in the opposite corner of the room, usually has no traffic through the "work triangle." The work triangle is defined by the location of the range, the sink, and the refrigerator. This is also a convenient arrangement if more than one person uses the kitchen, or if a person in a wheelchair prepares meals.

The U-shaped kitchen has counters and appliances on three sides. No traffic passes through the work triangle. A common modification is the broken-U, which has a passageway in one section of the U and guides traffic through the work triangle.

The plan for a corridor kitchen places the counter and appliances on opposite sides of the work area. This plan eliminates dead corners, but usually has traffic through the work triangle. The corridor and the U-shape are the most compact and convenient layouts; the cook does less walking than in the other arrangements.

**CABINET SPACE**

After deciding on the basic configuration, the next step is to determine how much storage space will be needed. The amount of cabinet space the plan requires depends on the number of food items, utensils, and dishes to be stored. Families with special dietary needs—such as kosher kitchens where meat and dairy products are stored separately—may need additional storage.

For efficient use, items should be stored where they are first used. Cabinets near the eating area or the sink should provide enough space for dishes and glasses. Cabinets for serving dishes should be placed near the range. If the cook uses a microwave oven instead of a range, serving dishes used to heat food in the microwave should be stored near the food preparation area.

**Base Cabinets**

The typical base cabinet is 34 1/2 inches high. After the cabinet is installed, the countertop is placed on the cabinet, bringing the overall height to 36 inches. Most base cabinets have one drawer and two shelves. Typically, base cabinet shelves in stock cabinets are not adjustable. Fixed shelves cause disorder and fatigue because the storage space cannot be tailored to the cook’s needs.

To provide the most functional storage, the plan should call for base cabinets with an adequate number of drawers, pull-out shelves, and flexible storage. Drawers, properly sized for the stored
items and with good adjustable dividers, are the most functional storage units. Pull-out shelves, trays, and baskets work well and can be adjusted according to need.

The length of the accessible base-cabinet front is known as the base cabinet frontage. This frontage is an initial measure of the adequacy of kitchen storage.

Although the bulk storage space under the sink is useful, it does not have multiple shelves; and, therefore, is not included in the base cabinet frontage. Drawers as a part of a freestanding or slide-in range do not provide adequate storage and should not be included in frontage calculations.

The recommended standards for total base cabinet frontage are as follows:
- Minimum 6 feet
- Medium 8 feet
- Liberal 10 feet

Items stored in corner base cabinets with stationary shelves are difficult to reach. Do not include this storage when computing base cabinet frontage. Use of lazy-susans or other fully accessible corner storage devices makes it easier to reach items stored in a corner base cabinet. Full use of the corner area provides extra storage equal to 6 inches of base cabinet frontage.

Wall Cabinets

The typical wall cabinet is 30 inches high and has two to three adjustable shelves. As with base cabinets, adjustable shelves allow the shelves to be spaced according to the height of the stored items.

Place wall cabinets 15 to 18 inches above the counter. This allows ample room for a mixer or other equipment used on the counters. For convenience in daily use, place the third shelf of wall cabinets no more than 72 inches from the floor.

The amount of dinnerware is the key to wall-cabinet storage requirements.
- With dinnerware storage for four people, wall cabinet frontage should equal the recommended base cabinet frontage.
- When planning to store dinnerware for 12 people, the wall cabinet frontage should be increased by 48 inches.

Place wall cabinets for everyday dishes near either the sink or the dining area (preferably accessible to both). Also, place wall cabinets above all counters where food will be prepared and above the major appliances.

When measuring the frontage of wall cabinets, do not count wall cabinets over the refrigerator, oven, sink, and range or built-in range-top. These cabinets are generally too high for everyday use, but they provide storage space for items used infrequently.

Storage-Wall Cabinets

If wall cabinet frontage needs exceed the amount of base cabinet frontage, or if the space available for wall cabinets is limited, as in kitchens with large windows, use a full-height cabinet.

A full-height cabinet, known as a storage wall or pantry, contains six or more shelves and provides storage at a convenient and accessible height. A storage wall or pantry unit is 12 to 24 inches deep and 72 to 84 inches tall. Each inch of frontage in a storage wall at least 12 inches deep is equal to 2 inches of wall cabinet frontage. Each inch of frontage in a storage wall at least 20 inches deep equals 2 inches of base cabinet frontage.

The location of the storage wall may violate the recommendations for putting storage at the place of first use. However, this is not a severe disadvantage if the kitchen has at least 6 feet of three-shelf wall cabinets over the work counters and a counter near the storage wall.

**SPACE FOR APPLIANCES**

Space must be planned for the major kitchen appliances. The frontage for each appliance varies with the different makes and models.

If you plan the kitchen before selecting the appliances, use the following allowances:
- 36 inches for the refrigerator
- 36 inches for a double-bowl sink
- 27 inches for a single-bowl sink
- 24 inches for a dishwasher
- 30 inches for a built-in wall oven
- 24 inches for a separate microwave oven
- 30 inches for a freestanding range
- 36 inches for a built-in cooktop

If you select appliances before planning the kitchen, use the actual dimensions.
The size and type of appliances will affect the available storage and counter space. For example, a built-in oven will decrease counter space; however, base cabinet frontage may increase depending on the overall height of the built-in oven. A built-in cook-top usually increases base-cabinet frontage because a cook-top is shallow and provides usable storage below.

If two people cook and share food preparation, separate the cooking units, such as a cook-top and a microwave oven. Add a second sink, even if this reduces counter and storage space slightly. In two-cook kitchens, the second sink can reduce traffic in the work area.

Combined Counters
In most kitchens, the counter space is continuous; some counters can be used for more than one function. Whenever two or more counters are combined, the multiple-use counter should equal the longest counter in the group plus 12 inches. However, the combination of multiple-use counters should not reduce the total base cabinet frontage below the recommended total.

### ACTIVITY SPACE

Activity space is the space a person needs to function efficiently in the kitchen. Cooks need space to move around without bumping into open cabinets, dishwashers, or refrigerators. Activity space falls into two categories—work area and access space.

Cooks need adequate work areas. Work area space is provided so that another person can walk or edge past the cook.

Access space is the space needed to open and close cabinets and appliances. This space is critical in corners and when cabinets are at right angles to each other.

Two other space requirements are also important in a kitchen—space for a dining area and access space in front of a storage wall. The minimum, medium, and liberal allowances for the four activity spaces are given below.

### Access Space

Access space is the space between cabinets or appliances at right angles to each other. To provide access to the side of such a space, use 30 inches minimum, 34 inches medium, and 38 inches liberal.

### Work Area

Work area space should provide room for another person to walk or edge past. The recommended clearance for the work area between base cabinets or appliances opposite each other is 48 inches minimum, 54 inches medium, and 60 inches liberal. The medium and minimum standards are only wide enough to allow a person to turn sideways and edge past the cook.

The same clearances are required from a counter front to a table, a wall, or to the
Dining areas must provide enough room for chairs and passageways. See text for wheelchair clearance requirements.

A Space for a passageway.
B Space to edge past a seated person or to rise from a chair.
C Space to use a storage wall with a chair at the table.

face of a storage wall if the space is part of a work area.

Dining Area

The dining area can be part of the kitchen or separated by a peninsula or counter. Different clearances are recommended for the space beside a dining table that does not face a workspace.

If there is no passageway or counter space (see B, at left), the clearance from the table to a wall or counter back should be 26 inches minimum, 30 inches medium, and 36 inches liberal. Liberal clearance allows a person enough walking space to leave the table without disturbing others.

If there is a passageway along one side of the table (see A, at left), the clearance to a wall or counter back should be 30 inches minimum, 36 inches medium, and 44 inches liberal. The liberal clearance allows room for a person to walk past a seated person. An additional 6 inches is needed for a person to walk past a person seated in a wheelchair.

Storage wall access is space in front of the storage wall (see C, at left). If there is no passageway, the clearances between the front of a storage wall with sliding doors and a table or a wall should be 30 inches minimum, 34 inches medium, and 38 inches liberal. For storage walls with hinged or folding doors, allow room for the door to swing open plus 16 inches. For access by a person in a wheelchair, 60 inches of clearance is needed in front of the storage wall.

Combined Clearances

Space in a kitchen may fall into more than one category. For instance, you may have a dining area adjacent to the storage wall access.

When an area qualifies under two of the following categories, use the largest clearance:

- Access space
- Work area
- Dining area
- Storage wall access

Except for wheelchair access, clearances never need to be larger than those given for the liberal allowance. Clearances larger than the liberal recommendations require the cook to do more walking. Most people prefer additional storage space, not more clearance.

PLANNING FOR EFFICIENT OPERATION

After determining the kitchen layout and choosing suitable space standards, the next step is to arrange the appliances and work areas for maximum efficiency. Each kitchen has areas for food preparation or clean-up. The arrangement of these work areas, or centers, is critical to a functional kitchen. As you plan the general kitchen arrangement, concentrate on the location of these work centers.

The following four work centers should be included in every kitchen plan:

1. Refrigerator
2. Sink
3. Food preparation
4. Range-serve

Each center includes storage cabinets, work counters, and the appliances required for that particular activity.

Arrange the work centers to reduce the amount of walking in the kitchen and to allow work to flow easily from one center to another. The work areas should not be split by traffic. Normally, the greatest number of trips during meal preparation occurs between the sink and the primary cooking unit (top of the range, cook-top, or microwave). Many trips occur between the food preparation center and the sink and between the food preparation center and refrigerator.

A convenient sequence for a right-handed person is from right to left; that is, the refrigerator center followed in turn by the food preparation, sink, and range-serve centers. However, having each center complete in itself, with adequate counter and storage space, is more important than having the correct sequence.

Counter space for two or more centers can be combined. It is usually best to combine counters for at least two centers into one continuous counter, with corresponding storage above and below. For instance, the plan may call for the sink center to include a dishwasher. The range-serve center can be modified to include range ventilation or an oven. The microwave may be part of the range-
serve center, or it can become its own center.
An isolated unit is satisfactory if it is a complete center with storage cabinets and work counters, and not merely an appliance standing by itself. Perhaps the plan will work better with a separate oven or microwave center.

**Refrigerator and Oven Centers**
The first step in planning the arrangement of the centers is to place the tall appliances—the refrigerator and built-in oven. Locate these appliances to avoid blocking the flow of work from one counter to another.
Position the refrigerator to avoid interfering with the transfer of food between counters and the dining table. If the refrigerator is hinged at the right, it should be at the right end of the counter. This location is convenient for transferring food to and from the refrigerator. The door swing on most refrigerators, with the exception of side-by-side models, can be easily reversed by putting the hinge on the other side.
In meal preparation, the built-in conventional oven is used much less than the sink, refrigerator, or cook-top. Therefore, saving steps is not an important factor in establishing the built-in oven location. If practical, it should be near the food preparation center.

**Sink Center**
The sink with its adjoining cabinets is by far the most-used center. It should be centrally located. As previously mentioned, a second sink is convenient in kitchens used by more than one person. Installing the sink along an interior wall, possibly back-to-back with another room with plumbing in it, will cost less and in cold climates is a good building practice. With a corner sink, the plumbing can be placed on the interior wall, while a window near the corner provides a view.
When planning the location of the primary sink in an L- or U-shaped assembly, it is important to allow standing space on each side of the sink. For minimum and medium kitchens, 9 inches of counter frontage is needed, measured from the edge of the sink bowl to the corner of the counter fronts. In liberal kitchens, 15 inches is recommended. When there is more than one sink in the kitchen, the counter frontage and storage recommendations apply to the primary sink.

**Food Preparation Center**
A food preparation center will be equally convenient if it is placed between the refrigerator and sink or between the sink and range. If a microwave oven is used in meal preparation, it should be placed near the food preparation center. Storage for most packaged, canned, and bottled foods should be nearby.
If one food preparation center is to be used simultaneously by two persons, extend the counter frontage requirement by 24 inches to a minimum of 60 inches. However, if the center is located at a corner, even a 60-inch center is difficult for two persons to use at the same time.

**Range-Serve Center**
Avoid placing the range or cook-top under a window. The curtains may catch fire and reaching over the range to open windows is hazardous. To prevent people from knocking hot pans off the range include a minimum of 12 inches of counter space on either side of it so that handles can be turned to extend over the counter area and not into the path of kitchen traffic. Because this counter will also serve as a space to set down hot pans, a heat-resistant counter material or insert should be used on at least one side.
Today, meals are often prepared in a microwave oven, not on the top of the range. If the microwave is essential to efficient meal preparation, ensure that the microwave is placed in the central work area. When planning the central work area, you may need to place the microwave where you would normally place the range.
If the microwave is used primarily for heating snack or convenience foods, it may be placed out of the central work area. There should be a minimum of 15 inches of counter next to the microwave. Also, place the microwave at a height that is accessible and safe for all users, but out of reach of children who are not yet old enough to use it safely.
When planning the location of cook-tops or ranges, consider how these smoke-producing appliances will be ventilated. Use kitchen ventilation at the range or cook-top to remove water vapor, grease, smoke, odors, and combustion gases. Grease and smoke will make walls and ceilings dirty.

Two types of ventilation appliances are common—recirculating and exhaust systems. While both are sold as range ventilation systems, the recirculating systems do not remove water vapor or combustion gases. They merely pass the air above the range top through a filter then return it to the room. Effective ventilation can only be achieved with an exhaust system.

For cook-top ventilation, select a hood that extends over most of the cooking area to remove cooking contaminants. When the range or cook-top is placed in an island, down-draft ventilation systems, usually incorporated in the cooking appliance, may be used. Down-draft ventilation removes combustion gases and other cooking contaminants from low pans and grills that are close to the vent. However, down-draft ventilation is not as effective in venting vapors from large pots or pans farther from the vent intake.

Work Triangle

Establish an efficient “work triangle” between the major appliances. Meals can be prepared more efficiently if the sink, refrigerator, and the primary cooking unit are at points of a triangle. The total of all three sides should preferably be less than 23 feet, but never over 26 feet. The distances should be measured from the center front of each appliance. The triangle will be smaller with the corridor and U-shaped assemblies. Check the location of doorways, and make sure the traffic pattern through the kitchen will not cut across the work triangle.

Kitchens designed for use by more than one person may have two work triangles. The refrigerator center is typically common to both triangles, and two sinks and/or two separate cooking centers (e.g., cook-top and microwave oven) are provided.

HOW TO SCORE KITCHEN PLANS

A kitchen rating system, based on the planning recommendations in this circular, has been devised by the Building Research Council as a guide for judging kitchen designs. The rating system can be used on any residential kitchen using conventional storage cabinets.

The rating system assigns a point value to each item in the kitchen plan. The higher the score, the better the kitchen plan. Because some planning faults are more serious than others, the points assigned to each factor below have been weighted accordingly.

The basic requirements for the successful design of the kitchen work area are the following:

- Storage space
- Appliance space
- Counter space
- Activity space

The scoring system is divided into two parts. Part I is used to evaluate the amount of storage and counter space. Part II is used to evaluate the arrangement of appliances, storage, and activity space.

All of the requirements on the second part of the scoring system are not applicable in every kitchen arrangement. When a requirement does not apply, score the maximum number of points to avoid penalizing a kitchen unnecessarily. Several items in the scoring system have three separate ratings to evaluate the kitchen according to the total house area.
**Kitchen Planning Scoring Chart**

**PART I: Storage and Counter Space**

**Storage**

Base cabinets must have at least one drawer and two shelves not less than 20 inches deep. Drawers are preferable to stationary shelves. Include storage below built-in cooking surface unit and below oven if the storage space is at least 20 inches high. Each inch of frontage in a full-height storage wall at least 20 inches deep is equal to 2 inches of base cabinet. Do not include cabinet space under the sink, drawers in ranges, or corner cabinets with stationary shelves.

1. Total base cabinet frontage = _____ inches.

<table>
<thead>
<tr>
<th>House size</th>
<th>Less than 72&quot;</th>
<th>72&quot; to 95&quot;</th>
<th>96&quot; to 119&quot;</th>
<th>120&quot; or more</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 1,000 sq. ft.</td>
<td>0</td>
<td>17</td>
<td>17</td>
<td>17</td>
</tr>
<tr>
<td>1,000-1,800 sq. ft.</td>
<td>0</td>
<td>12</td>
<td>17</td>
<td>17</td>
</tr>
<tr>
<td>Over 1,800 sq. ft.</td>
<td>0</td>
<td>7</td>
<td>12</td>
<td>17</td>
</tr>
</tbody>
</table>

Wall cabinets must have 3 or more shelves at least 10 inches deep. Each inch of frontage in a full-height storage wall at least 12 inches deep is equal to 2 inches of wall cabinet. Do not include cabinets over ranges, refrigerators, built-in ovens, sinks, or corner cabinets with stationary shelves.

2. Total wall cabinet frontage = _____ inches.

<table>
<thead>
<tr>
<th>House size</th>
<th>Less than 72&quot;</th>
<th>72&quot; to 95&quot;</th>
<th>96&quot; to 119&quot;</th>
<th>120&quot; to 143&quot;</th>
<th>144&quot; to 167&quot;</th>
<th>168&quot; or more</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 1,000 sq. ft.</td>
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<td>17</td>
<td>17</td>
<td>20</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>1,000-1,800 sq. ft.</td>
<td>0</td>
<td>12</td>
<td>17</td>
<td>17</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Over 1,800 sq. ft.</td>
<td>0</td>
<td>7</td>
<td>12</td>
<td>17</td>
<td>17</td>
<td>20</td>
</tr>
</tbody>
</table>

**Counter Space**

The “length of counter” refers to the total frontage for a section of counter that extends between appliances or that extends from an appliance to the end of the counter. This may be the combined frontage of a continuous counter on two adjoining walls. The frontage of any section of counter can be scored for more than one of the following needs.

3. Length of counter frontage adjacent to the latch side of the refrigerator = _____ inches.

<table>
<thead>
<tr>
<th>House size</th>
<th>Less than 15&quot;</th>
<th>15&quot; to 17&quot;</th>
<th>18&quot; or more</th>
</tr>
</thead>
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<tr>
<td>Less than 1,000 sq. ft.</td>
<td>0</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>1,000-1,800 sq. ft.</td>
<td>0</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Over 1,800 sq. ft.</td>
<td>0</td>
<td>2</td>
<td>5</td>
</tr>
</tbody>
</table>
**Building Research Council**

### Length of counter frontage to the right of the sink bowl

<table>
<thead>
<tr>
<th>House size</th>
<th>Less than 24&quot;</th>
<th>24&quot; to 29&quot;</th>
<th>30&quot; to 35&quot;</th>
<th>36&quot; or more</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 1,000 sq. ft.</td>
<td>0</td>
<td>10</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>1,000-1,800 sq. ft.</td>
<td>0</td>
<td>6</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Over 1,800 sq. ft.</td>
<td>0</td>
<td>3</td>
<td>6</td>
<td>10</td>
</tr>
</tbody>
</table>

* If dishwasher is used score 10 points.

#### 5. Length of counter frontage to the left of the sink bowl

<table>
<thead>
<tr>
<th>House size</th>
<th>Less than 18&quot;</th>
<th>18&quot; to 23&quot;</th>
<th>24&quot; to 29&quot;</th>
<th>30&quot; or more</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 1,000 sq. ft.</td>
<td>0</td>
<td>10</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>1,000-1,800 sq. ft.</td>
<td>0</td>
<td>6</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Over 1,800 sq. ft.</td>
<td>0</td>
<td>3</td>
<td>6</td>
<td>10</td>
</tr>
</tbody>
</table>

* These counter requirements assume a right-to-left dishwashing sequence.

#### 6. Length of counter frontage to both sides of either the range or built-in surface unit

<table>
<thead>
<tr>
<th>House size</th>
<th>Less than 15&quot;</th>
<th>15&quot; to 17&quot;</th>
<th>18&quot; to 23&quot;</th>
<th>24&quot; or more</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 1,000 sq. ft.</td>
<td>0</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>1,000-1,800 sq. ft.</td>
<td>0</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Over 1,800 sq. ft.</td>
<td>0</td>
<td>2</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

#### 7. Length of counter frontage to one side of the oven

<table>
<thead>
<tr>
<th>House size</th>
<th>Less than 15&quot;</th>
<th>15&quot; to 17&quot;</th>
<th>18&quot; or more</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 1,000 sq. ft.</td>
<td>0</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>1,000-1,800 sq. ft.</td>
<td>0</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Over 1,800 sq. ft.</td>
<td>30</td>
<td>2</td>
<td>5</td>
</tr>
</tbody>
</table>

#### 8. Length of counter frontage at the microwave oven

<table>
<thead>
<tr>
<th>House size</th>
<th>Less than 15&quot;</th>
<th>15&quot; to 17&quot;</th>
<th>18&quot; or more</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 1,000 sq. ft.</td>
<td>0</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>1,000-1,800 sq. ft.</td>
<td>0</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Over 1,800 sq. ft.</td>
<td>30</td>
<td>2</td>
<td>5</td>
</tr>
</tbody>
</table>

#### 9. Length of counter frontage for mixing

<table>
<thead>
<tr>
<th>House size</th>
<th>Less than 36&quot;</th>
<th>36&quot; to 41&quot;</th>
<th>42&quot; to 47&quot;</th>
<th>48&quot; to 53&quot;</th>
<th>54&quot; or more</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 1,000 sq. ft.</td>
<td>0</td>
<td>7</td>
<td>10</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>1,000-1,800 sq. ft.</td>
<td>0</td>
<td>7</td>
<td>10</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Over 1,800 sq. ft.</td>
<td>0</td>
<td>3</td>
<td>5</td>
<td>7</td>
<td>10</td>
</tr>
</tbody>
</table>

#### 10. Total amount of counter frontage

<table>
<thead>
<tr>
<th>House size</th>
<th>Less than 72&quot;</th>
<th>72&quot; to 95&quot;</th>
<th>96&quot; to 107&quot;</th>
<th>108&quot; or more</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 1,000 sq. ft.</td>
<td>0</td>
<td>13</td>
<td>13</td>
<td>13</td>
</tr>
<tr>
<td>1,000-1,800 sq. ft.</td>
<td>0</td>
<td>8</td>
<td>13</td>
<td>13</td>
</tr>
<tr>
<td>Over 1,800 sq. ft.</td>
<td>0</td>
<td>3</td>
<td>8</td>
<td>13</td>
</tr>
</tbody>
</table>

**Total Part I**
PART II: Arrangement

Storage

11. If the base cabinets have at least 9 drawers or pull-out trays (one at least 24 inches wide and 12 inches deep with vertical pan dividers and another not more than 3 inches deep inside): .................. 3 points

12. Wall cabinets are scored according to the location and storage capacities:
   a) If wall cabinets have adjustable shelves: .................. 4 points
   b) If there are at least 42 inches of wall cabinets within 72 inches of the center front of the sink: .................. 3 points
   c) If there are at least 72 inches of wall cabinets over the counter space: .................. 10 points
   d) If the wall cabinets are at least 15 inches above the counter top and if the third shelf is no more than 72 inches above the floor: .................. 6 points

Counter

13. If the length of the counter front between the edge of the sink and the corner of a counter is: at least 15 inches in a house larger than 1,800 sq. ft., or at least 9 inches in a house smaller than 1,800 sq. ft.*: .................. 3 points

   *If a kitchen has a sink with no counter space on either side, it should be automatically ranked as poor.

Appliances

14. If two or more of the primary work centers (sink, range-serve, refrigerator) adjoin each other: .................. 10 points

15. The scoring for dishwashers varies according to whether the dishwasher is built-in or portable:
   a) If the center front of a built-in dishwasher is not more than 72 inches from the center front of the sink: .................. 10 points
   b) If a portable dishwasher is stored so that it does not interfere with usage of any cabinets or appliances: .................. 10 points
   c) If there is no dishwasher, these requirements are not applicable, therefore: .................. 10 points

16. If no two work centers are separated by a tall appliance (refrigerator or built-in oven) or a full-height storage wall: .................. 6 points

17. If there is a double-bowl sink or a single-bowl sink and an automatic dishwasher (front opening) in a liberal or medium kitchen, or a single-bowl sink in a minimum kitchen: .................. 3 points

Activity Space

18. Clearance to provide access between the front of a cabinet or appliance and the blank face of an assembly at right angles to it = _____ inches.

<table>
<thead>
<tr>
<th>House size</th>
<th>Less than 30&quot;</th>
<th>30&quot; to 33&quot;</th>
<th>34&quot; to 37&quot;</th>
<th>38&quot; or more</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 1,000 sq. ft.</td>
<td>0</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>1,000-1,800 sq. ft.</td>
<td>0</td>
<td>4</td>
<td>6</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Over 1,800 sq. ft.</td>
<td>0</td>
<td>2</td>
<td>4</td>
<td>6</td>
<td>6</td>
</tr>
</tbody>
</table>
9. Clearance for the work area between base cabinets or appliances opposite each other = _____ inches.

The same clearance is required from a counter front to a table, wall, or face of a storage wall if the space is a work area.

<table>
<thead>
<tr>
<th>House size</th>
<th>Less than 48”</th>
<th>48” to 53”</th>
<th>54” to 59”</th>
<th>60” or more</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 1,000 sq. ft.</td>
<td>0</td>
<td>6</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>1,000-1,800 sq. ft.</td>
<td>0</td>
<td>4</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Over 1,800 sq. ft.</td>
<td>0</td>
<td>2</td>
<td>4</td>
<td>6</td>
</tr>
</tbody>
</table>

20. Determine the score for the work triangle by adding up the legs of the triangle:

a) If the length of the work triangle (the sum of the distances between the center front of the primary sink, refrigerator, and the primary cooking unit) is less than 23 feet: score 8 points

b) If the length of the work triangle is 23 to 26 feet: score 4 points

c) If the length of the work triangle is more than 26 feet: score 0 points

21. If the traffic from the front door or service entrance to the rest of the house does not cross the work triangle or there is an alternative route outside of the work triangle that does not conflict with other activities: score 6 points

22. Check the location and swing of doors, and score accordingly:

a) If all doors, including the refrigerator door, swing so they do not interfere with the work area in front of counters or appliances: score 10 points

b) If only one door interferes: score 5 points

c) If two or more doors interfere: score 0 points
Windows

If the window dimensions cannot be measured or determined from plans, assume a glass height of 36 inches. For a kitchen that has a wall that opens into a dining or family room, the windows need not be in the kitchen, but they should equal 10 percent of the combined room area.

23. If the total glass area in windows (width times height) is at least 10 percent of the total floor area of the kitchen: .......................... score 6 points

Ventilation

For mechanical ventilation use either a kitchen exhaust system with a minimum air-flow capacity of 100 cfm (cubic feet per minute).

24. If there is an operable window in the kitchen or there is mechanical ventilation: ................................................ score 3 points

Safety

25. If the heating units of the range or cook-top are arranged so that the pot handles overhang the front or side of the counter or extend over other heating units: ........................................... deduct 6 points

26. If the vertical clearance above the range or cook-top to cabinets is less than 30 inches or if the vertical clearance to cabinets protected with a flame retardant millboard covered either with sheet metal or a metal ventilating hood is less than 24 inches: ........................................... deduct 15 points

27. If the range or cook-top is below a window: ........................................... deduct 10 points

Rating

The scoring system is divided into two parts. For example, 96/91, would indicate 96 (Excellent) in storage and counter space and 91 (Fair) in arrangement. The rating for each part is as follows:

Excellent ....... 96-100
Good ........ 92-95
Fair .......... 85-91
Poor ........ 84 or less

Total part I = (Storage)

Total Part II = (Arrangement)

Total Deductions

Total Part II
# The Kitchen Score—How To Use It

## Comparing Two Plans

The two kitchen plans illustrated show how the scoring system can be used to plan efficient kitchens. Cabinet sizes and clearances are shown, but cabinet heights, drawers, and adjustable shelves are not. The scores assume the cabinets meet these requirements. The plans are scored based on recommendations for liberal kitchens. Both plans occupy the same space, 10'-0" by 13'-6", and have the same number of doors and provisions for dining area. The difference is in the number of appliances, amount of storage and counters, and arrangement of those elements. The available space is used better in Plan B than in Plan A.

### Plan A

In this plan, the sink unit and the adjoining cabinets furnish all the storage and counter space for the kitchen. The range and refrigerator are placed together, away from the rest of the equipment.

The faults in the kitchen result in a "poor" rating for both Part I, Storage and Counter Space, and Part II, Arrangement.

### Plan B

This room is the same size as in Plan A, with planning faults corrected. The location of the corner door has been changed to allow for more cabinets, which occupy two walls. The additional storage space for dinnerware for 12 people, credited in step 2, was obtained by using part of a storage wall between the kitchen and an adjoining room—which is outside the kitchen.

Because wall cabinets are installed above all counters, there is room for only one window. To provide sunlight, more window area was needed. The additional glass area is in a room opening into the kitchen, but it could have been provided by skylights.

This plan has a built-in oven, cook-top, and dishwasher. With the dishwasher placed at the right of the sink, the requirements for sink counter-space improve.

This kitchen rates "excellent" in both Part I and Part II of the scoring system and more closely meets recommendations for good design and two-cook kitchens.

### PART I

<table>
<thead>
<tr>
<th>Step</th>
<th>Amount</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>84&quot;</td>
<td>7</td>
</tr>
<tr>
<td>2</td>
<td>84&quot;</td>
<td>7</td>
</tr>
<tr>
<td>3</td>
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<td>4</td>
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<tr>
<td>7</td>
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</tr>
<tr>
<td>8</td>
<td>**</td>
<td>5</td>
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<tr>
<td>9</td>
<td>42&quot;</td>
<td>5</td>
</tr>
<tr>
<td>10</td>
<td>84&quot;</td>
<td>3</td>
</tr>
</tbody>
</table>

**Total Part I:** 47

### PART II

<table>
<thead>
<tr>
<th>Step</th>
<th>Amount</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>*</td>
<td>3</td>
</tr>
<tr>
<td>12a</td>
<td>*</td>
<td>4</td>
</tr>
<tr>
<td>12b</td>
<td>84&quot;</td>
<td>3</td>
</tr>
<tr>
<td>12c</td>
<td>84&quot;</td>
<td>10</td>
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<tr>
<td>12d</td>
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<td>6</td>
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</tr>
<tr>
<td>17</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

**Total Part II:** 79

* The score is based on the use of cabinets which meet these requirements.

* * Not applicable

The primary faults are the following:

- Insufficient base cabinet and wall cabinet;
- Lack of counter beside the range and refrigerator;
- Inadequate counter for the mix center;
- Traffic through the work triangle;
- The dining area interferes with the work area;
- The door interferes with the use of the refrigerator.
GOOD DESIGN

Good design features contribute to the safe, accessible, and adaptable use of the kitchen and accommodate various individual needs.

All items in the score sheet are important for good design; however, the following items must be met:

- Items 1 through 10 must all meet minimum standards or greater.
- For items 11, 12a, 14 and 16, use the minimum requirements indicated.
- For items 18 and 19 use the liberal requirements.
- The unsafe conditions described in items 25, 26, and 27 must not occur.

Going beyond the minimum requirements will make the kitchen a more comfortable space in which to work. Additional desirable features include:

- Work space at more than one height, such as 30 inches as well as 36 inches.
- Cabinet units under the sink and cook-top should not have a center stile. The base of these cabinets should be removable for wheelchair access.

TWO-COOK KITCHENS

Kitchens may need to accommodate more than one person in the household. If two persons share food preparation and clean-up, the following items should be met as indicated.

- Items 4 and 5 are critical for the primary sink in the kitchen. Counter frontage to both sides of a secondary sink is desirable; at a minimum, one side should meet the standard in Item 5.
- Item 9 should be a minimum of 60 inches if two persons use this mix center simultaneously. If two persons work simultaneously but at two separate mix areas, use the standards in Item 9 for each of the mix areas.

Endnotes

1 In establishing these standards, the number and kinds of items to be stored were based on previous research as reported in Building Research Council Circular C5.31 (out of print), Cabinet Space For The Kitchen. Kitchens meeting limited-minimum requirements are called "minimum" kitchens; those meeting limited-ample or liberal-minimum requirements are called "medium" kitchens; and those meeting liberal-ample requirements are called "liberal" kitchens.

2 The "liberal" space standards are from Space Standards for Household Activities-University of Illinois Agricultural Experiment Station Bulletin 686 by H.E. McCullough, Kathryn Philson, Ruth H. Smith, Ann L. Wood and Avis Woolrich.

3 Data reported in Illinois Research by the Illinois Agricultural Experiment Station, Winter, 1961, in an article entitled "Kitchens to Date—Practical, Convenient Arrangements," by Helen McCullough and Mary B. Farnham.