



*Considerations in*

**PLANNING  
KITCHEN  
CABINETS**

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## FOREWORD

This bulletin is the first of two publications dealing with the planning of kitchen cabinets. The information contained in it and in its companion, Station Bulletin 446, *Patterns for Kitchen Cabinets*, will be found useful by:

1. **HOMEMAKERS** in preparing sketches of the kitchen cabinets they want for their homes, in holding conferences about building them, or in selecting factory-built cabinets.
2. **HOME CRAFTSMEN** in planning new work or the remodeling of existing installations.
3. **TEACHERS** of courses in house planning and industrial arts.
4. **DESIGNERS** of factory-built cabinets.

The suggestions apply to the problems encountered in planning and selecting cabinets for Oregon rural homes of various cost levels.

The main objectives in the recommendations given are:

1. **SUITABILITY** to use, with due recognition of the part played by storage and work areas in making it possible for the homemaker to apply work simplification principles to kitchen tasks.
2. **ECONOMY** in cabinet space, and in materials and labor used in cabinet construction.

Construction allowances and conformance to architectural standards were checked by H. R. Sinnard, A.I.A., Department of Agricultural Engineering, Oregon Agricultural Experiment Station.

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## SUMMARY

The modern kitchen is organized on the work center principle as nearly as space and cost limitations permit. Ideally, the work surfaces will be adequate for the tasks done there, and the equipment and supplies used in connection with each task will be stored within easy reach of the work surface.

Cabinets are a relatively large item in the cost of a house. Cost can be kept down by making them only as large as their intended uses require.

Maximum utility for a given cost can be achieved by (1) listing the functions the kitchen must serve, (2) assigning each function to a unit of the installation, (3) planning each unit to serve the function or functions assigned to it.

The cost of an entire kitchen may be minimized by the following procedure:

1. Plan counter space to provide the minimum adequate amount of work surface needed at each center.
2. Utilize the available storage space above and below each surface.
3. Provide for the remaining storage needs by means of floor-to-ceiling cabinets.

Flexibility in the use of cabinets and ease of conversion to new uses are important because of the variety of activities carried on in the kitchen and the likelihood of changes occurring in the kinds of work done there.

If a cabinet is to be used as intended, convenience to the user must be given first consideration wherever possible. For, if it is convenient, the worker will take increasing pleasure in its use, and sooner or later come to think that it was worth the cost.

Good lighting, both natural and artificial, is essential to insure the use of the various parts of the kitchen for the purposes for which they were planned. Dark places, however conveniently arranged, will be shunned by the worker.

The height of a work surface should be such as to permit the worker to stand or sit upright with upper part of arm in natural position. There should be toe space under the edge of the cabinet for the standing worker and room for thighs and feet under the counter used by the seated worker.

Recommended dimensions of kitchen surfaces are:

1. Depth of work surface—24 inches
2. Width of work surface—
  - At side of sink, 36 inches
  - At side of stove (unless part of range), 21 inches

## SUMMARY—Continued

- Mixing table, 28 inches (36 inches if free standing)
- Planning desk, 28 inches
- 3. Height of work surface—
  - Floor of sink,  $32\frac{1}{2}$  inches
  - Mixing table, 32 inches
  - Surface at side of range—same height as range surface
  - Lap table or board, 24 inches
  - Kitchen planning desk, 28 inches

The distance between wall and base cabinets should be kept to the minimum in order to provide the maximum amount of readily accessible storage space in the upper cabinet. No single figure can be recommended for minimum clearance; it varies from 12 to 26 inches in relation to uses of surface, height of surface, difference in depths of wall and base cabinets, and importance of uniformity in the kitchen assembly.

Every kitchen should have a place for the worker to sit at work with feet on floor. This may be a pull-out board set just high enough to clear the thighs (24 to 26 inches).

Because of the amount of time spent at the sink, it is highly desirable that sitting there should be as comfortable as possible. Three provisions are important: (1) minimum interference with knees under edge of sink, (2) minimum interference with natural position of feet and legs, (3) a foot rest, in the cabinet if not on the stool.

Unfinished boards should be provided below or near every surface where cutting of foods is likely to be done. These may be kept in slots immediately beneath the counter.

Each pull-out board to be used without removal from its slot (other than a cutting board) constitutes a special problem in location and in construction. Recommended heights are:

- Pastry board— $33\frac{1}{2}$  inches
- Writing board—28 inches
- Step board—12 inches
- Food chopper board—32 to 36 inches
- Lapboard—24 to 26 inches

Step boards should be installed only in kitchens where the higher shelves are needed for the storage of articles that are frequently used.

Requirements of user that limit storage space in a cabinet are:

- Height of toe space—3 inches
- Maximum height of shelf for articles in frequent use—72 inches
- Maximum height of a shelf, contents visible—61 inches
- Maximum height of top drawer—59 inches

# Considerations in Planning Kitchen Cabinets

## INTRODUCTION

### THE KITCHEN CABINET AS A PLANNING PROBLEM

Cabinets designed for specific functions constitute the accepted and justly popular means of providing work surfaces for kitchen processes, as well as space for utensils and dishes in regular use, small amounts of long keeping foods, and other articles stored in the kitchen. Properly designed, constructed, and arranged, they constitute a highly important means of conserving the time and energy of the housewife and of lightening her management problems.

In the West, kitchen built-ins are usually made of wood. A few are purchased ready to install; more of them are made in cabinet shops, while still more are made by carpenters or home owners. Kitchen cabinets constitute a relatively large element in the cost of a house. They should be designed for the convenience, comfort, and safety of the kitchen worker, should provide adequate and appropriate storage for equipment and supplies used in the kitchen, and should contribute to the appearance of the room. At the same time they should be planned to provide the necessary storage and work space at the lowest possible cost of room space as well as labor and materials, and construction details should be simplified as much as possible. To complicate the problem, there is the need for ready conversion of storage and work areas to new and unanticipated uses.

While built-ins are found in practically all kitchens except those in very old homes and in unfinished houses, not many measure up to the standards set in the foregoing paragraph. In many cases they have cost more than was necessary; more counter space has been provided than the housewife actually needs, and heavier lumber was used in construction than was suitable or necessary. Work surface heights are set with little regard for the requirements of the worker as she washes dishes, prepares made dishes, or tends food at the range. Storage space is wasted by setting shelves too far apart, by making drawers too shallow or too deep, or by spacing drawers too far apart. Wall and base cabinets are set so close together that work on the counter top is hampered, or are farther apart than necessary. Lower cabinets are made too narrow and wall cabinets too wide. Drawers are not well made or fitted. Food cabinets are not sanitary. Toe room under cabinets is insufficient or nonexistent. Edges of work surfaces are inadequately sealed against water.

### CONTENT AND PURPOSE OF THIS BULLETIN

Economy of space, labor, and materials is the basis for the suggestions contained in this publication and its companion bulletin, Station Bulletin 446, *Patterns for Kitchen Cabinets*. They apply to installations in moderately priced homes and provide answers for the problems that arise in remodelling existing installations. They are intended to serve as the basis of husband-wife and mother-son conferences about kitchen planning or remodelling; to supply reference material concerning the desires and needs of home owners in conferences with carpenters, contractors, architects, and dealers in building supplies; to serve as bases for judging the adequacy of proposed plans for new or remodelled installations or for choosing factory-made units; and to serve as guides to home craftsmen.

The suggestions for use of space that are contained in these bulletins are derived from the results of investigations carried on over a period of several years. These include studies of space requirements for the various kitchen processes; inventories of articles stored in the kitchens of representative homes; inquiries into the customs and preferences of homemakers as they concern specific details of cabinet planning; physical measurements of homemakers and older girls; storage space requirements of the various groups of articles that are stored in the kitchen; step-saving kitchen arrangements; and similar inquiries.

The results of these studies indicate a degree of similarity in the requirements of families that are homogeneous with respect to such factors as income (amount and source) and location of house (urban or rural) sufficient to warrant the assumption that plan patterns for built-ins would be useful. The standards and patterns selected for inclusion in these bulletins are those which supply answers to problems frequently met in planning Oregon rural homes.

The construction standards and practices listed in the bulletins were selected by the Agricultural Engineering Department of the Oregon Agricultural Experiment Station as those most nearly meeting the goals of economy in amount of materials and labor, simplicity and ease of construction, durability, pleasing appearance, and low cost.

### FACTORS INFLUENCING THE PLANNING OF CABINETS

The points to consider in developing patterns for kitchen cabinets fall into three categories. The first includes those that apply to the uses of cabinets—kitchen organization and management, the physical requirements of workers, and storage needs. In the second

group are those factors that constitute limitations to planning, such as assumptions as to cabinet materials and construction methods, utilities and purchased equipment, and the need for limiting cost. Finally there are the various circumstances that may need to be taken into consideration in utilizing the patterns for cabinets in kitchen layouts.

### KITCHEN ORGANIZATION AND MANAGEMENT

The modern kitchen is organized on the work center principle as nearly as space and cost limitations permit. Ideally the work surfaces at each center will be adequate for the tasks done there, and the equipment and supplies used in connection with each task will be stored within easy reach of the work surface.\*

The kitchen, however, must be viewed as a unit and the amount of walking from center to center is also important. To reduce kitchen mileage as well as to utilize work and storage space to the best advantage, centers may overlap or be combined.

The desirable arrangement of centers with respect to one another is also an important factor influencing cabinet design. The following rule is useful in developing step saving plans: "Arrange the kitchen so that the sum of the distances between range, sink, and meal table (or dining room door) is as small as possible."

In planning the kitchen it is important, therefore, for efficiency as well as cost to aim at the minimum adequate total amount of cabinet work surface. For a specific kitchen this standard varies with respect to these factors: (1) types of work now done there and anticipated changes; (2) amount of work surface required for each process and possible changes in the future; (3) time of day for which work surface would be required for process; (4) whether there is a movable table (or tables) available for use as a work surface.

Conditions favoring efficiency and dispatch in kitchen processes are (1) arrangements permitting the efficient use of tools, (2) space to assemble the supplies and utensils used at one time, and (3) storage planned for ease of handling in taking out and putting away articles stored.

Work simplification principles emphasize the desirability of arrangements for holding certain hand tools rigid so as to leave both hands free for speeding up the task, for using feet as well as hands, and for letting gravity do the work whenever possible. Because of

\* Centers, their functions and storage needs are listed in Oregon Experiment Station Circular 131, *Planning the Kitchen*.



the variety of activities carried on in the home kitchen and because of the frequent and often unpredictable changes in the kinds of work done there, it is frequently difficult to reconcile the requirements for efficiency in doing specific tasks with the general goals of economy, flexibility, and attractive appearance. But the results of the research in housework simplification now in its initial stages may be expected to point out changes in the design of kitchen cabinets that are justified by the time and energy saved.

The bases for the minimum dimensions of a work surface are (1) the counter space needed for the convenient assembly of the tools and supplies used in connection with the work done there and (2) the width of the space required by the worker. Ease of handling in assembling articles and putting them away is an important consideration in the choice of types of storage facilities (as shelves or drawers) and in the location of these facilities with reference to the work surface.

Since a floor-to-ceiling cabinet is less expensive than a wall-and-base cabinet supplying the same amount of storage space, the cost of installation for a given situation may be minimized by applying the following rule:

Provide the minimum adequate amount of work surface needed at each center; utilize the available storage space below and above each surface; provide for the remaining storage needs by means of floor-to-ceiling cabinets.

If there is a meal table in the kitchen, it serves the average woman fairly well as a surface for dishwashing and food preparation. If this arrangement presents no major management problems, double or triple duty for the meal table constitutes an important means of reducing the cost of built-ins. One should not overlook the fact, however, that if the meal table must serve also as a work table, it cannot at the same time be a family between-meal center. Unless the need for economy is pronounced, the between-meal uses of the dining table had best be confined to child's play and study, writing and record keeping, ironing, sewing, and other activities not connected with food.

Adequacy in the natural and artificial lighting of the room, in amount, quality, and location, is essential to the functioning of a kitchen plan. All work and storage areas should be adequately lighted by both means. Generally speaking, where lighting is adequate for some areas but not for others, there is a corresponding variation in the extent to which they are used with some parts of the kitchen overcrowded and others not used to capacity.

### PHYSICAL REQUIREMENTS OF WORKERS

The kitchen installation should make it possible for the worker to maintain a healthful and comfortable posture and to work efficiently with the minimum of discomfort and fatigue. For the average woman this implies that:

1. Work surfaces should not be so low as to require stooping for more than brief periods, nor should they be so high as to require the arms to be held away from the body.
2. Heavy articles should be stored as nearly as possible on a level with the surface where they are used, but not higher than this surface.
3. Articles in frequent use should be stored within reach of the worker as she stands on the floor.
4. There should be room for the toes under the edge of the cabinet used by the standing worker and for thighs and extended feet under that used by the seated worker.
5. Lateral spaces should be sufficient for arm movements required for the various kitchen tasks.
6. Facilities for doing work while seated should be a part of every kitchen installation to make it possible to save energy while doing time-consuming tasks, and to make kitchen work easier during periods when the homemaker finds it fatiguing to stand. This height should be as low as clearance over thighs will permit, in order that the arms of the worker will need to be raised as little as possible.
7. Consideration should be given to the requirements of left-handed as well as right-handed workers.

The importance of these provisions varies with individual homemakers. For healthy women with good posture habits and well-developed muscles, the need for stooping, stretching, and lifting while doing housework may be an asset rather than a liability. But kitchen work is done by women varying in physical fitness; they may not have strong legs, backs, and arms; or they may be convalescent or suffering from chronic ailments but obliged to do their housework because of lack of help. With age the body may become thickened and less flexible, and weaknesses develop in back, feet, or legs.

Because kitchen cabinets last indefinitely and are expensive to remodel, it is good policy to give careful consideration to the physical requirements of the worker—not only the present requirements of the woman for whom the installation is planned, but also changes in her requirements as time goes on and the possibility of a change in occupancy.

Safeguards against physical injury should be considered for all members of the family. Some important provisions are these:

1. Facilities for reaching the upper part of wall cabinets (as stool or step board) should be conveniently located and safe to use.
2. Counter overhang should be kept to a minimum. Usually no overhang is needed at the sides, and one inch is sufficient to cover the projection of knobs and drawer pulls.
3. Door of upper cabinet should not extend over edge of lower cabinet or equipment more than two inches, unless the former is so located that its door may stand open when desired.
4. If tilt bins are preferred, their design should be of the type that insures balance regardless of weight of contents.

Certain safeguards against discomfort and fatigue which concern other requirements than those for posture, space for movement, and safety, may influence the design or placement of cabinets. For example, the place where the worker stands while washing dishes and doing other tasks requiring considerable amounts of time needs to be placed at a distance from a wood range on account of its heat; this requirement may influence the design of the entire kitchen layout.

### STORAGE REQUIREMENTS AND METHODS

The major considerations in planning storage are (1) convenience for the worker, (2) care of article stored, (3) space economy, (4) flexibility in use, (5) appearance of room, (6) ease of keeping clean and in order, (7) cost. These considerations determine the form of storage for each type of article (as drawers and shelves) and the utilization of the space within the drawer or on the shelf.

#### Steps in Planning Storage

The recommended method of planning storage cabinets includes the following steps:

1. List items to be stored.
2. Group them according to the work surfaces where they will be used most frequently.
3. Group articles at each work center with respect to similarity in storage requirements.
4. Determine unit dimensions for each group of articles stored and margins for hand action in placing and removing them.
5. Assign each group to a specific part of the space below, above, or adjacent to the work surface.

6. Determine or estimate the total space required for each group of articles.
7. Formulate detailed plans for each part of the storage space, making such adjustments in assignments as are needed for the best use of space.

### Grouping of Stored Articles; Use of Storage Space

Some of the more important suggestions for planning and using kitchen storage space follow. Other desirable practices will be noted in connection with suggested planning patterns.

1. Group articles stored as to (a) place of use, (b) frequency of use, (c) weight, (d) height, and (e) whether vision is needed for placement or removal.
2. Store together the cooking equipment and food supplies for which room temperature is satisfactory if they are used at the same center and if they require the same method of storage (shelf, drawer, or hook.)
3. Keep together parts of a piece of equipment, as meat grinder.
4. Nest or stack frequently used articles (as plates or bowls) only when duplicates or when used at one time (as serving dishes usually used for the same meal).
5. Stack plates by sizes. Limit stacks of cups to two. Do not stack glasses; if they flare at the top, invert every other one.
6. Store dishes or piles of dishes in a single row on a shelf, except when there are duplicates; for example, cups, goblets, or piles of plates of the same size and shape.
7. Store packaged supplies in single rows with narrower dimension parallel with the shelf.
8. Store kettles, skillets, mixing bowls, etc., so that any article can be removed or replaced without displacing another.
9. Assign space in cabinets so that the articles most frequently used are easiest to reach.
10. Store heavy articles at or below the level of the work surface where used.
11. Hang frequently used utensils on the sides of the cabinet (rather than on back).
12. Hang heavy utensils (as cast iron skillet) not higher than 42 inches from floor of room.

13. Hang frequently used utensils between 36 inches and 64 inches from floor of room when the holes for hanging are small or must be guided over the hook.

14. Provide arrangement for hanging dish towels where they will dry by the next meal time.

15. Provide for the storage of the electric mixer in a place where it can be used without lifting.

### Storage Facilities for Specific Materials

Following are the facilities that are suited to the storage of the materials specified. Where more than one type is listed, they are ranked in order of preference.\*

1. Small amounts of potatoes, onions, apples, etc.—ventilated drawer or drawer section in draft cooler, container on shelf in draft cooler.

2. Bread—metal cabinet on shelf, drawer.

3. Cake—metal cabinet on shelf, drawer.

4. Spices, seasonings, and leavening agents—shelf inside cabinet, open shelf above work table, rack on cabinet door.

5. Bottled flavorings—shelf inside cabinet, rack on cabinet door.

6. Dry groceries used from package—shelf, drawer.

7. Dry groceries not used from package, less than 10 pounds—container on shelf, section of drawer.

8. Dry groceries not used from package, 10 to 25 pounds—drawer or drawer section, container on shelf.

9. Dry groceries, large amounts (as flour, sugar)—entire amount in bin, small amount in container on shelf with remainder kept in storeroom.

10. Dishwashing supplies—shelf below or near sink, rack on door below sink.

11. Knives and small utensils—sectioned drawer equipped with ways of holding individual utensils in place, hooks or rack on wall.

12. Flat lids, trays, and shallow baking pans—slots between two shelves, racks on inside of cabinet doors, sectioned drawer.

13. Mixing bowls, kettles, etc. that cannot be hung—shelf inside cabinet, open shelf.

\* Preferences recorded are those of the homemakers cooperating in the Oregon 1942 Storage Preferences Study. Unpublished.

14. Saucepans and kettles that will hang—shelf inside cabinet, hung inside cabinet.
15. Skillets and griddles—hung inside cabinet, shelf inside cabinet.
16. Clean towels and dish towels—drawer.
17. Table silver—sectioned drawer.
18. Dishes—shelf inside cabinet.

### Clearances Around Stored Articles

In the interest of space economy, the clearance above and around stored articles should be the minimum required for safety and convenience in their placement and removal.

The margin needed above or at the side of an article stored on a shelf or in a drawer is the space required to place or remove it without danger of striking it against adjacent objects, edge of shelf, or side of cabinet, as well as space for fingers or hand. Obviously, less clearance is needed when objects are handled with care. But because the necessity for being mindful of the safety of stored articles adds to the time needed in handling them, the minimum desirable clearance is one that permits an experienced worker to remove and replace them speedily.

Following are suggested standards for minimum clearances about stored articles and special considerations in determining them:

1. Width of shelf. If articles stored are rigid or fragile (as dishes), allow at least  $\frac{1}{2}$  inch over the front-to-back over-all measure of the widest article assigned to the shelf. Allow  $\frac{1}{4}$  inch for nonrigid articles such as supplies in paper packages.

2. Length of shelf space. If article stored is not rigid and if it can be grasped at the top or in front (for example, packaged foods), an allowance of  $\frac{1}{4}$  inch between items is adequate. If the article is rigid but can be grasped at the top or in front (for example, pitcher),  $\frac{1}{2}$  inch per item is sufficient unless the article is large or unwieldy. If the object stored requires the use of both hands (for example, stack of dishes), allow 1 inch per item.

3. Inside width of drawer. See above, length of shelf space.

4. Width of door opening. The standard for the minimum width of an opening depends upon the width of the largest article likely to be stored behind it (measured in position as stored) plus the allowance required for hand action in placement or removal.

5. Distance between shelves. A minimum vertical clearance of 1 inch over an object is adequate. This measure must be added, however, to the over-all measure of the stored article, taken at the point where it is greatest *when the object is being placed or removed*, rather than when it is in place on a shelf. If a shelf is located about 42 inches from the floor (elbow height for the average woman) no allowance need be made for tipping the object in getting it into place. But for lower and higher shelves, it is important to take this matter into account. Extreme cases may be illustrated by the baking sheet stored in a vertical slot whose base is just within reach and the saucepan stored on the lowest shelf of a base cabinet.

Another special consideration in determining vertical clearances applies to stacks of nested dishes or utensils. Here the problem is to allow for the safe removal of an object from the stack. The clearance over the over-all height of the stack needs to be the height of one item (as cup or saucer) plus 1 inch. This measure can be reduced by  $\frac{1}{2}$  inch if the shelf above the stack is not full width, permitting the withdrawal of the top article in a diagonal direction.

6. Inside height of drawer. The minimum desirable clearance over materials stored in a drawer depends on whether the contents tend to pile up with drawer movement. Minimum clearances for bulk food materials (for example, flour) vary from 1 to 2 inches. (See Appendix Table C-10.)

Minimum clearance over utensils stored in a drawer depends upon whether the utensils are held firmly in position or whether they may shift with the movement of the drawer. If the former,  $\frac{1}{2}$  inch is sufficient. Clearance for utensils that shift varies with the shape of the utensil.

A word of caution in taking the over-all heights of stored articles is important. Measurements will be taken with the utensil or utensils in the position they may be expected to have in the drawer. But it is necessary to take the measure where it might be greatest; that is, to allow for possible carelessness in placement of contents. This consideration is especially important in determining the depth of a drawer for small utensils and tools.

7. Width of slot. Allow  $\frac{1}{2}$  to 1 inch margin over width of contents. If, however, in the removal of contents the hand enters the slot, its minimum desirable width is  $2\frac{1}{2}$  inches.

8. Height of slot in sectioned drawer or drawer inset. For food materials the edges of dividers should come within  $\frac{1}{8}$  inch

of the level of the drawer's edges. For utensils lying flat in a drawer, the height of the inset should be as small as possible. Usually  $1\frac{1}{2}$  inches is satisfactory. For utensils stored on edge the divider should be about 6 inches high.

9. Hanging space. When utensils are hung, a minimum distance of  $1\frac{1}{2}$  inches is recommended between tip of utensil handle and shelf or utensil above it. The minimum recommended distance between utensils hung back-to-back or between back of utensil and wall is 4 inches.\*

### CABINET CONSTRUCTION STANDARDS

In determining standards for the dimensions of kitchen cabinets from a consideration of kitchen processes and storage requirements, it is necessary to make certain assumptions concerning their construction. Current and local standards and recommended practices for these items are listed in the following paragraphs.

#### Materials

1. Frame, sides, shelves, drawers, dividers—plywood or stock sizes of soft-wood lumber; drawer glides and grinder board of hardwood.
2. Counter tops—varnished wood, processed wood, linoleum, stainless steel, monel metal, or plastic.

#### Ways of Building

In listing the following practices, the aim is the minimum amount of material, labor, and construction space allowances commensurate with functional requirements and economy in room space.

1. Extend wall cabinet to ceiling or drop ceiling.
2. Enclose vertical space in wall cabinet by a single door.
3. Put back and bottom in all cabinets.
4. Provide holes for shelf supports in sides of wall cabinets.
5. Make sides and back of hanging cabinets thick enough to permit installation of hooks.
6. Make doors of cabinets thick enough to permit installation of hooks or racks.
7. Form toe room by placing cabinet on a 2" x 4" piece of lumber turned on edge.

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\* Oregon Experiment Station Bulletin 356; *The Willamette Valley Farm Kitchen*, p. 64.



8. Face the construction over food drawers with metal or thin plywood.

9. Provide slots between shelves and sections in drawers by means of removable insets of thin plywood.

10. Install pull-out boards so they may be used in place. Slots for pull-out boards should be closed at the sides. The boards should fit as tightly as possible in their slots in order that there may be the least amount of play when the board is used in place. The slot need not be over one-eighth inch wider or higher than the board, if carefully constructed.

11. Nail wall cabinet to wall. Do not place brackets below it.

12. Provide space under sink with doors and with adequate means of ventilation.

13. Make front rim of sink bowl as narrow as possible.

14. Make apron as narrow as possible (construction below counter top and sink rim).

15. Install lip drawers and doors in preference to flush type.

In the following recommendations the aim is ease in caring for kitchen cabinets.

1. Use plain surfaces. Avoid grooves, holes, or corners that would be difficult to clean.

2. Make parts that require frequent cleaning removable (as screen over draft-cooler vent).

3. Design cabinets so that no food or trash can get into places not readily cleaned.

4. Choose surfacing materials that withstand heat, soap and water, and are not easily cut or indented.

### Construction Allowances

Tables A-1 and A-2, Appendix A, list the construction allowances assumed in planning the cabinets which meet standards contained in this publication. Table A-1 lists the thickness of materials used in making the cabinet frame, doors, drawers, shelves, and counter top; the width of facing strips and shelving; clearances for drawers and pullout boards; and certain over-all dimensions of parts of cabinets. Table A-2 lists the stock items available from Oregon dealers in building materials, including doors, drawers, and other parts of cabinets, room doors, and windows.

### COST OF CABINETS

The cost of cabinets varies with the quality of materials and workmanship, the number and variety of units in the kitchen ensemble, and the amount of labor required for finishings and fittings.

The cost of cabinets may be minimized by the following planning practices. Some of these suggestions are discussed in the foregoing section headed "Kitchen Organization and Management."

1. Employ construction practices that use the minimum amount of material.
2. Include only the amount of storage space shown to be needed by the individual family for whom the building is being done, and by the type of family likely to occupy the dwelling in years to come.
3. Keep the number of units in the ensemble to the minimum.
4. Include the minimum amount of counter space needed for the work to be done.
5. Provide floor-to-ceiling cabinets for storage needed in excess of that available in minimum-length wall and base cabinets.
6. Arrange storage for large, infrequently used articles in basement or other place where appearance of cabinet is not a factor.
7. Keep the number of drawers to the minimum.
8. Avoid unusual designs in facings, doors, and other structural features.

### HOUSE PLAN AND EQUIPMENT

Present conditions and trends with respect to the equipment of Oregon rural kitchens indicate the advisability of making the following assumptions in developing planning patterns for built-ins:

1. The house is or will be wired for electricity.
2. There will be installed, eventually if not at first, a sink with drain and piped hot and cold water.
3. There will be installed, eventually if not at first, a mechanical refrigerator and an electric, gas, or combination range.
4. There will be space outside the kitchen for the main supply of canned foods, frozen foods, long-keeping winter vegetables, and cured meats.
5. Room heat may be supplied by a warm air furnace, a wood range, or a kitchen heater.

In Table B-3, Appendix B, room allowances are given for purchased equipment whose dimensions and standards for placement may need to be considered in planning kitchen built-ins.

### KITCHEN PLAN; EXTERIOR CONSIDERATIONS

Often the problem in planning cabinets for a specific kitchen is not so much that of determining what would be most economical and useful to build, as that of making the most of what freedom one has in planning. Certain exterior considerations may take precedence over economy and usefulness in cabinets because of the appearance of the house or the room, or because economy and utility in the kitchen or in the house as a whole are greater than would be the case if cabinet planning were given precedence.

Planning kitchen cabinets may be influenced by the size and placement of room doors and windows and by the dimensions of purchased equipment such as refrigerator and range. It may be influenced by the need for providing wall and floor space for a chimney, heat register, ventilating fan; for openings to laundry chute, dust chute, wood lift; outside openings to draft cooler, woodbox, garbage compartment, or package receiver; and wall space for telephone, clock, radio, mirror, bulletin board, towel rack, or display space for decorative objects.

In general the considerations in room planning that take precedence over economy and utility in the cabinets themselves are:

1. The service entrance should be readily accessible to farm drive or farm buildings; the outside door should be placed with this end in view.
2. If the kitchen serves as a passage from one part of the house to another, that function is of primary importance in the location of room doors.
3. It should be possible for any door to remain open at least 90 degrees without interfering with the normal use of the kitchen.
4. The glazed area of windows must be at least one-eighth of the floor area.\*
5. For windows that are visible from highway or farm drive the exterior appearance of the house is the primary consideration in their selection and location.

\* Supplemental Property Standards and Minimum Construction Requirements for Single-family, One-story Detached Dwellings in Oregon West of the Cascades, January 1, 1940. This standard presupposes no reduction of light from porch overhang, nearby building, or trees and shrubbery.

6. The worker at the sink should have a view of the farm drive.
7. It should be possible to open any window of the kitchen while standing on the floor.
8. In the location of the kitchen chimney, circulation on all floors, economy in construction, and exterior appearance take precedence over economy and utility in cabinet design.
9. The chimney should extend into the kitchen rather than into the living room or dining room.
10. Provision for carrying away excess heat from the range is essential.
11. The coal or wood range should be placed so that the stovepipe does not cross a doorway or pass through a cabinet.
12. All fixed equipment should be placed against a wall, that is, with passage on not more than three sides.
13. The draft cooler should be located to insure good air circulation and minimum inside temperature in summer.
14. If family meals are usually eaten in the kitchen, the meal table should be placed along an outside wall with windows that provide view for persons seated.
15. The meal table should be located where it can be reached from the service entry or living portion of the house without passing between kitchen work centers.
16. Lines of cabinets should be planned with reference to structural features, as tops of doors, windows.
17. At least one window in the kitchen should overlook the children's outdoor play center.

## FUNCTIONS OF KITCHEN CABINETS

The following list of functions is intended for use in developing kitchen cabinet patterns or in checking the adequacy of a proposed set of kitchen cabinets for a specific situation. The first thing to do in using it is to cross off the items that do not apply to the problem under consideration. The next step is to decide what constitutes desirable provision for each of the functions that remain on the list. The items on the list have been numbered for convenience in allocating functions on drawings.

The list as a whole does not apply to any one set of kitchen requirements. Generally speaking, the kitchen of the small house may need to serve more functions than that of a house with more rooms, in order to prevent crowding too many functions into other rooms, or because the kitchen is the best available choice for the function in question.

The list of surfaces is not to be considered as a list of parts of the kitchen cabinet ensemble. A sink counter, for example, may be used also as a serving counter and as the surface needed near the refrigerator. A piece of purchased equipment may provide the necessary surface; for example, the meal table may double as the mixing table, and the range may supply the space needed for serving hot foods.

	<i>Activities<sup>1</sup></i>	<i>Materials stored<sup>1</sup></i>
PREPARATION AND SERVICE OF FOOD	1. Handle incoming supplies	S1. Long-keeping fruits and vegetables
	2. Wash foods	
	3. Handle foods after washing	S2. Opened food packages kept at room temperature
	4. Pare fruits and vegetables	S3. Opened food packages kept in cooler
	5. Slice vegetables	S4. Staples not used from packages
	6. Do mixing, beating	S5. Unopened cans and packages
	7. Do rolling, kneading	S6. Bread
	8. Use grinders, parers, etc.	S7. Cake
	9. Slice meat	S8. Cookies
	10. Do short-time food preparation near range	S9. Kettles, saucepans
	11. Make salads	S10. Colanders; strainers
	12. Extract juice; open cans; (equipment attached to wall)	S11. Grinders
	13. Slice bread, cake	S12. Juicer, can opener (used on wall)
	14. Dish up hot foods	S13. Skillets, griddles
	15. Dish up cold foods	S14. Beverage makers
	16. Serve meals to adults or family	S15. Mixing bowls
	17. Serve meals to children	S16. Baking utensils
	18. Put up lunches	S17. Knives; other small utensils
	19. Rearrange contents of refrigerator	S18. Measures
		S19. Utensils used in preparing baby's food
		S20. Dishes used in family meal service

<sup>1</sup>Items are numbered for convenience in indicating the proposed functions of areas, in making kitchen cabinet plans. Activities are assigned numbers without prefix. Materials stored are indicated by numbers preceded by "S."

	<i>Activities<sup>1</sup></i>	<i>Materials stored<sup>1</sup></i>
PREPARATION AND SERVICE OF FOOD (continued)	20. Rearrange contents of cooler	S21. Dishes used for company meals S22. Large platters; trays; flat utensils S23. Empty food containers, till taken to store room S24. Storage containers not in use S25. Table silver S26. Electrical cooking appliances S27. Table cloths; table mats S28. Napkins S29. Lunch and picnic supplies S30. Lunch and picnic equipment S31. Recipes S32. Garbage container S33. Extra table leaves S34. Fuel for kitchen stove
DISHWASHING	21. Scrape and stack soiled dishes 22. Wash dishes 23. Handle dishes after washing 24. Clean silver	S35. Dish pans S36. Drainer S37. Minor equipment S38. Supplies S39. Dish towels; dish cloths (supply) S40. Dish towels in use
FOOD PRESERVATION	25. Wash food 26. Wash jars and utensils 27. Handle equipment before and after washing 28. Prepare fruits and vegetables 29. Fill containers 30. Cut up meat 31. Prepare meat for freezing or curing 32. Use meat grinder, lard press, etc.	S41. Canning equipment S42. Drying equipment S43. Freezing equipment S44. Curing equipment S45. Left-over supplies
CARE OF MILK	33. Wash utensils 34. Handle supplies and equipment	S46. Milk pails, milk pans S47. Buttermaking equipment
FLOWER ARRANGEMENT	35. Arrange flowers	S48. Flower containers; holders

<sup>1</sup>See note on first page of this list.

	<i>Activities<sup>1</sup></i>	<i>Materials stored<sup>1</sup></i>
FARM AND HOME BUSINESS	36. Write letters; keep records 37. Use telephone 38. Post messages on board	S49. Bills, receipts, letters S50. Account and record books S51. Catalogs S52. Instruction books and bulletins. S53. Supply of stationery
LAUNDRY WORK	39. Dampen unironed clothes 40. Fold and stack clothes	S54. Washing equipment S55. Washing supplies S56. Ironing board S57. Ironer S58. Iron S59. Pressing cloths S60. Unironed clean clothes S61. Ironed garments till put away—on hangers S62. Ironed garments till put away—folded
SEWING; MENDING	41. Cut out garments 42. Baste and pin garments	S63. Folded cutting table S64. Sewing machine S65. Yard goods S66. Findings and minor equipment S67. Mending scraps S68. Articles to be mended S69. Articles in process of making
REST; RECREATION	43. Place radio for use while working	S70. Radio receiver S71. Magazines S72. Newspapers
CARE OF CHILD	44. Bathe baby 45. Change baby 46. Let child play	S73. Baby clothes S74. Equipment used in care of child S75. Play materials
PERSONAL— KITCHEN WORKER	47. Wash hands 48. Use toilet articles 49. Reach high shelves 50. Sit at work	S76. Towels on rack S77. Paper toweling in holder S78. Clean towels (supply) S79. Toilet articles S80. Aprons in use S81. Clean aprons S82. Clothing worn while doing outdoor work

<sup>1</sup>See note on first page of this list.

	<i>Activities<sup>1</sup></i>	<i>Materials stored<sup>2</sup></i>
PERSONAL—	51. Wash face and hands	S83. Toilet articles
FAMILY	52. Use toilet articles	S84. Hand towels in use
		S85. Clean towels (supply)
		S86. First Aid equipment
		S87. Coats; sweaters
		S88. Caps; gloves
		S89. Boots, galoshes
CLEANING		S90. Equipment used in cleaning kitchen
		S91. Supplies used in cleaning kitchen
		S92. Equipment used in cleaning other parts of house
		S93. Supplies used in cleaning other parts of house
		S94. Waste basket
		S95. Tools
		S96. Clean rags

## STANDARDS FOR WORK SURFACES

### DEPTH OF WORK SURFACE\*

In the interest of space economy as well as step saving and flexibility in use, work surfaces should be as wide as the arm reach of the worker will permit. Depths of 24 inches to 27 inches enable the worker to assemble supplies and small equipment in a semicircle about the area where the work is done. If no assembly space is required, and if the equipment used in the process permits, the work space may be as narrow as 16 inches.

### WIDTH AND HEIGHT OF WORK SURFACE

Measures for width and height of a specific work surface depend on the kind of work done there, the equipment and supplies assembled, the width of the surface, and the position (standing or sitting) of the worker.

In the kitchen of the average private dwelling (as contrasted with that of an institution), there is little loss of utility in assigning more than one function to the same surface. It is important to pro-

<sup>1</sup>See note on first page of this list.

\* Oregon Experiment Station Bulletin 348, *Standards for Working-Surface Heights*, pp. 33-34; Figure 8, p. 35.



vide surfaces for food preparation and dish washing at the right and left of the sink, but one of these may also be used as the serving counter if it is not too far from the meal table or dining room door. If the mixing counter is adjacent to the range, it may serve as the cool surface needed there. If the mixing surface is adjacent to one of the sink counters, the latter may be used to set baking pans or containers for supplies.

Tables 1 and 2 give the data needed as a basis for consideration concerning the widths and heights of work surfaces, whether assigned to a single function or to more than one. Table 1 gives the suggested minimum widths of surfaces that are 24 inches to 27 inches in depth and the processes that constitute area determinants. These widths were arrived at through experimentation during which each task was done as the average housekeeper prefers to do it.\*

Table 1. SUGGESTED MINIMUM WIDTHS OF KITCHEN WORK SURFACES, AND AREA-DETERMINING PROCESSES.

Area	Minimum width	Process
	<i>Inches</i>	
Counter at left of sink .....	32	Draining and stacking dishes
Sink bowl .....	30	Washing and rinsing dishes
Counter at right of sink .....	36	Scraping and stacking dishes
Surface adjacent to range .....	21	Serving hot foods
Mixing surface—free standing .....	36	Making pies (supplies assembled)
Mixing surface—adjacent to another unit .....	28	Making pies (supplies assembled)
Serving counter—free standing .....	28	Arranging salad plates
Serving counter—free standing .....	36	Arranging dinner plates
Surface near open side of refrigerator ..	15	Placing dishes taken from refrigerator
Planning desk .....	28	Writing while seated at center of desk

Table 2-a lists minimum and maximum heights of work surfaces suitable for the average woman, in relation to position (standing, sitting) and in relation to the movements required. If the process requires the manipulation of tools (as beater, stirring spoon), the range in heights is less than that of a process requiring only the handling of supplies and tools, as in the case of stacking dishes.

Table 2-b gives heights that are suited to the average homemaker. The Oregon-Washington study made in 1936† showed that heights suited to the average woman were reasonably satisfactory for eight women out of ten. Therefore, it seems wise to use measures suited to the average in building or remodelling the kitchen of a house for rent or sale. In the case of one built for owner occupancy, also, it is best to use these measures unless the homemaker is unusually short or unusually tall. If this is the case, the measures in Table 2-b are

\* Oregon Experiment Station Bulletin 356, *The Willamette Valley Farm Kitchen*, pp. 23 and 31.

† Oregon Experiment Station Bulletin 348, *Standards for Working Surface Heights*.

recommended as the basis for test. That is, the homemaker should start by doing some beating and kneading on a work table 32 inches high, then repeat the test on successively higher or lower surfaces until she has arrived at a decision as to the best height for her.

The main consideration in deciding upon the height of the sink is its intended use. In low-cost installations a practical scheme is to choose a small sink for use only as a catch basin, and to set it at one end of the work table. If, however, the sink is large enough for dish washing, as most housekeepers prefer, then its floor should be set high enough to be suitable for that purpose. For the average woman, this measure is  $32\frac{1}{2}$  inches.

The sink floor will need to be lower than  $32\frac{1}{2}$  inches when the sink bowl is more than six inches deep, because the maximum desirable height of any surface is about 38 inches (Table 2-a). If the handling of dishes, utensils, and supplies is the major use of the sink counter, then the maximum height of  $38\frac{1}{2}$  inches is the desirable one. Even then, the floor of the eight-inch sink is two inches lower than the height preferred by the average woman.

The height of the sink may also be influenced by whether the adjacent counter must serve both for draining and stacking dishes and for food preparation. Whether one of the sink counters can be used as a mixing counter without loss of utility depends upon several conditions. If beating and mixing are usually done with a power beater and if little or no bread is made, the height of the mixing surface is relatively unimportant; but if beating and mixing are done by hand or if bread-making is a major activity, then a counter on a level with the sink rim is five or six inches too high. In the latter situation, if the demands of space economy or cost require that the sink counter serve also as a mixing table, the sink counter may be set lower than the sink rim, or a pull-out board may be used for mixing operations. The feasibility of the last-named alternative depends upon whether floor space in front of the cabinet is adequate for the extended surface, as well as the worker, and upon the stability of the board.

If the mixing table height is independent of that of the sink rim, then the major consideration is whether it should be chosen mainly for rolling and kneading, or also for hand-mixing and beating. If bread is seldom made and a power mixer is habitually used, precision in the choice of this measure is of minor importance. But if mixing is done by hand, or bread made at home, the height of this surface is important. In recommending a height of 32 inches, more weight is attached to the requirement for mixing and beating than to that for rolling and kneading.

Heights of Work Surfaces for Growing Girls—Measures planned for the homemaker appear to be satisfactory for high school girls.\* But where it is desirable to plan for the convenience of girls less than fourteen years old, the measures in Table 2-b should be reduced one to one and a half inches.

Heights of Surfaces for Men—The measures in Table 2 should be increased by two or three inches in adapting them to kitchens where the workers are men.†

Table 2. HEIGHTS OF WORK SURFACES SUITABLE FOR THE AVERAGE WOMAN.<sup>1</sup>

a. Range in height in relation to movements required by process

Position of worker	Movements	Range in height of surface from floor
		<i>Inches</i>
Standing	Manipulation of tools in doing hand beating; stirring; kneading .....	31 to 34
	Handling of supplies and equipment; slicing; cutting .....	30 to 38
Sitting	Manipulation of tools in doing hand beating; stirring; kneading .....	24 to 28
	Handling of supplies and equipment .....	24 to 32

b. Suggested heights for specific surfaces

Position of worker	Surface	Height of surface from floor
		<i>Inches</i>
Standing	Floor of sink .....	32½
	Counter on level with rim of sink six inches deep .....	38½
	Mixing table .....	32
	Cooking surface of range .....	32
	Sewing (cutting, basting) .....	35½
	Pastry board in use .....	33½
Sitting	Kitchen planning desk .....	28
	Lap table or pull-out board .....	24

<sup>1</sup>Adapted from standards described in Oregon Experiment Station Bulletin 348, *Standards for Working Surface Heights*, and unpublished results of studies of range heights made by the Washington State Experiment Station.

Figure 1 shows a woman of average stature doing various kitchen tasks on surfaces set at heights approximating those suited to the average homemaker.‡ There is also included a picture contrasting the position of the upper arm when doing hand beating at surfaces 32 inches and 36 inches high.

Figure 2 illustrates various standards needed in determining the dimensions of cabinets serving various purposes in the kitchen.

\* Doris Anderson, *Dimension Standards for a High School Foods Laboratory*. Thesis in partial fulfillment of the Master's Degree. Oregon State College School of Home Economics, 1941.

† Estimate based on a consideration of differences in physical measures of 562 Oregon and Washington women and 200 Oregon men.

‡ Oregon Experiment Station Bulletin 348, *Standards for Working Surface Heights*, p. 14.



A

HEIGHT OF SINK RIM  $38\frac{1}{2}"$ . GOOD POSTURE FOR HANDLING DISHES ON SINK COUNTER AND IN SINK BOWL.



B



C

HEIGHT OF SURFACE  $32"$ . POSITION OF LEFT ARM IS GOOD.



D

HEIGHT OF SURFACE  $36"$ . POSITION OF LEFT ARM IS POOR.



E

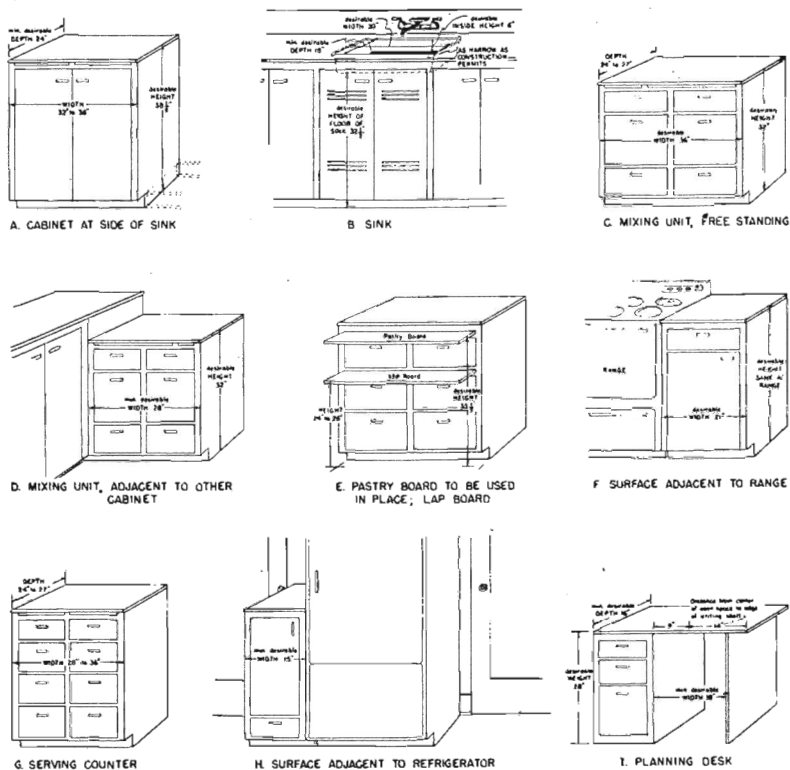
HEIGHT OF SURFACE  $32"$ . NATURAL POSITION FOR UPPER ARM WHILE KNEADING DOUGH OR ROLLING OUT PASTRY.



F

CUTTING ON PULLOUT BOARD SET IN APRON UNDER COUNTER  $38\frac{1}{2}"$  HIGH.

Figure 1. Heights of work surfaces for the average woman.



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Figure 2. Measures for width, depth, and height of cabinets in relation to location and intended uses.

## CLEARANCE OVER WORK SURFACE

### Standards for Minimum Clearance

In Table 3 there are listed specifications for minimum clearance over work surfaces for various sets of conditions. The heights of work surfaces listed are those of current models of ranges, cabinet sinks, and factory-made kitchen cabinets (36 inches) and approximations of the average of heights chosen by Oregon-Washington homemakers.\*

The distance from a work surface to the base of the cabinet above it should be kept to the minimum in order to provide the maxi-

\* See Appendix Table D-1.

Table 3. MINIMUM CLEARANCE OVER WORK SURFACE.

(Distance from floor of room to base of wall cabinet, and to a six-inch open shelf, that supplies minimum clearance between a work surface about 24 inches wide and of specified use and height, and a wall cabinet of specified width.)

Conditions			Clearance needed	Specifications	
Surface and use	Approximate height of surface	Approximate depth of cabinet above <sup>1</sup>		Height of base of wall cabinet	Distance from floor to top of open shelf 6 inches wide
	<i>Inches</i>	<i>Inches</i>	<i>Inches</i>	<i>Inches</i>	<i>Inches</i>
Sink counters, <sup>2</sup> neither used for mixing .....	36	12	12	48	.... <sup>2</sup>
Sink counters, <sup>2</sup> neither used for mixing .....	38	12	12	50	.... <sup>2</sup>
Sink counters, <sup>2</sup> one used as a mixing table .....	36	12	16	52	46
Sink counters, <sup>2</sup> one used as a mixing table .....	38	12	16	54	48
Sink bowl, 8 inches deep....	36 <sup>4</sup>	6	12 <sup>5</sup>	48	.... <sup>2</sup>
Sink bowl, 8 inches deep....	36 <sup>4</sup>	12	26	62	48 to 56
Sink bowl, 6 inches deep....	38 <sup>4</sup>	6	12 <sup>5</sup>	50	.... <sup>2</sup>
Sink bowl, 6 inches deep....	38 <sup>4</sup>	12	18	56	50
Mixing table .....	32	8	16	48	.... <sup>2</sup>
Mixing table .....	32	12	20	52	46
Mixing table .....	36	8	14	50	.... <sup>2</sup>
Mixing table .....	36	12	16	52	.... <sup>2</sup>
Electric or gas range <sup>6</sup> .....	32	8	16	48	42 <sup>7</sup>
Electric or gas range <sup>6</sup> .....	32	12	18	50	44 <sup>7</sup>
Electric or gas range <sup>6</sup> .....	36	8	16	52	46 <sup>7</sup>
Electric or gas range <sup>6</sup> .....	36	12	18	54	48 <sup>7</sup>
Serving counter .....	36	12	12	48	.... <sup>2</sup>
Serving counter .....	36	14	14	50	.... <sup>2</sup>
Serving counter .....	38	12	12	50	.... <sup>2</sup>
Serving counter .....	38	14	14	52	.... <sup>2</sup>
Sewing machine—drop head..	30 <sup>8</sup>	12	24	54	....
Sewing—portable machine on table .....	30 <sup>8</sup>	12	24	54	....
Sewing counter (cutting, basting) .....	36	12	26	62	48 to 56
Sewing counter (cutting basting) .....	38	12	24	62	50 to 56
Writing surface .....	23 <sup>8</sup>	8	8	36	.... <sup>2</sup>
Writing surface .....	23 <sup>8</sup>	12	18	46	40
Wood box open at top .....	34 <sup>9</sup>	12	20	54	42

<sup>1</sup>The designated width of lumber used for sides. See Table A-1, Appendix A.

<sup>2</sup>Open shelf not recommended.

<sup>3</sup>Surface adjacent to sink bowl.

<sup>4</sup>Height of sink rim.

<sup>5</sup>This measure may need to be increased for certain types of sink trims (faucets, spout, soap dish).

<sup>6</sup>Including adjacent built-in used for serving hot foods and for short-time food preparation.

<sup>7</sup>A 6-inch shelf would extend only 2 or 3 inches over the cooking surface.

<sup>8</sup>For worker seated.

<sup>9</sup>Height of front edge.

imum amount of readily accessible space for storage in the upper cabinet. This recommendation is in keeping with the principles of time and motion economy, because when storage space for supplies and tools is within reach of the worker, fewer steps are required for the work done. Due to the variety of utensils and supplies used in the average kitchen, readily accessible storage within reach of the worker is at a premium.

No single figure can be recommended for minimum clearance. It varies in relation to the uses of the work surface, the height of the surface, and the difference between the depths of wall and base cabinets. To be taken into account are (1) the arc described by the head of the user if her work requires bending over the surface, (2) extent of forward motion of hands and arms, (3) maximum height of the hands above the surface, (4) need for unobstructed view of process or tools used, (5) heights of utensils used, as electric mixer, (6) parts of equipment, such as the light fixture of a range or the faucet and spout at the sink.

### Procedure in Making Decisions Concerning Clearances

If a wall-and-base cabinet is free-standing and its uses are not likely to vary, the best procedure is to make the wall cabinet as shallow as its intended contents will permit. Minimum clearance between the wall cabinet and the base cabinet should be allowed unless it is desirable to line up the bottom of the wall cabinet with some nearby design element. If the uses of these cabinets might vary with successive housekeepers, an increase in depth of wall cabinet and in clearance above the work surface over that listed in Table 3 might be needed to provide for this possibility.

If counters assigned to various uses are continuous or adjacent, some increase in the clearance above them may be needed for the sake of appearance and economy in construction. Whether or not the demands of appearance require complete uniformity in the height of work surfaces, in the depths of wall cabinets, and in the clearance between wall and base cabinets is a matter of opinion.

If wall cabinets extend over two or more work surfaces that are of the same height but for which minimum clearances differ, a satisfactory compromise may be obtained by making all of the wall cabinets the same depth, and filling in irregularities in the height of their bases by narrow open shelves. Or, the height of the bases of the wall cabinets may be uniform and their depths varied. Four adaptations of the data in Table 3 to the situation where wall cabinets extend over the sink and the surfaces flanking it, the range, and the mixing table, and where all surfaces are 36 inches high are as follows:

## PLAN A

1. Twelve-inch cabinets over sink counter and sink bowl.
2. Eight-inch cabinets over range and mixing table.
3. Base of upper cabinet 52 inches from floor except over sink bowl, which is 62 inches.
4. May have a 6-inch open shelf above the sink bowl, in line with the bases of flanking cabinets.

## PLAN B

1. Twelve-inch cabinets over sink counters, range, and mixing table; 6-inch cabinet over sink bowl.
2. Base of section over sink counters and bowl, 48 inches from floor; over range and mixing tables, 54 inches. Six-inch open shelf 48 inches from floor may extend over range and mixing table.

## PLAN C

1. Twelve-inch cabinet over all. Section above sink bowl 62 inches from floor, remainder 54 inches.
2. Six-inch open shelf may extend under entire cabinet, 48 inches from floor. There is space for a second 6-inch shelf above the sink bowl.

## PLAN D

1. Twelve-inch cabinet over-all. Section over sink counters, 48 inches from floor; over sink bowl, 62 inches; and over range and mixing table, 54 inches.
2. Six-inch open shelf 48 inches from floor may extend over range, sink bowl, and mixing table. A second shelf may extend over the sink bowl.

When wall cabinets extend over surfaces that vary in height, the demands of appearance and of economy in cost of construction will usually require some compromise with the goal of space economy. The following are suggested plans for wall cabinets for various situations when the sink is 6 inches deep and set with rim 38 inches from the floor, the mixing table is 32 inches high, and the range 36 inches high.



## SITUATION I

Wall cabinets continuous over sink counter (neither used as mixing table) and sink bowl.

Plan A. Six-inch cabinet over the sink bowl and 12-inch cabinets over the sink counters. Bases of upper cabinets continuous; height 50 inches.

Plan B. Twelve-inch cabinet over all surfaces. Height of base of section over sink bowl, 56 inches. Height of base of sections over counters, 50 inches. A 6-inch shelf may extend over the sink bowl on a line with the bases of the flanking wall cabinets.

## SITUATION II

Wall cabinets continuous over sink counters (one used as a mixing table) and sink bowl.

Plan A. Twelve-inch cabinets above sink counters and 6-inch cabinet above sink bowl. Base continuous, height 54 inches.

Plan B. Twelve-inch cabinet over all surfaces. Height of sections over sink counters, 54 inches. Height of section over sink bowl, 62 inches. A 6-inch open shelf may be placed over the sink bowl in line with the bases of the cabinets over the counters.

## SITUATION III

Wall cabinets continuous over sink counter and mixing table.

Plan A. Twelve-inch cabinet over sink counters; 8-inch cabinet over mixing table. Bases of cabinets continuous, height 50 inches.

Plan B. Twelve-inch cabinet over both surfaces, with base 52 inches high. A 6-inch open shelf 46 inches high may extend under both sections.

## SITUATION IV

Wall cabinets continuous over range and mixing table.\*

Plan A. Eight-inch cabinet over both surfaces. Base 52 inches high. A 6-inch open shelf 46 inches from the floor may extend under both sections of the wall cabinet.

\* Suggestions for height of cabinet or open shelf above electric or gas range may have to be modified if model has light, high oven, or surface cover.

Plan B. Eight-inch cabinet over both surfaces. Height of base of section over mixing table 48 inches and of section over range, 54 inches. A 6-inch open shelf extends over the range in line with the base of the adjoining cabinet.

Plan C. Twelve-inch cabinet over both surfaces with base 54 inches high, and a 6-inch open shelf under the entire cabinet, 48 inches high.

The standards for clearance between base and wall cabinets recommended in the foregoing presentation are illustrated by Figures 3, 4, 5, and 6. Application of these standards has been made to four common types of kitchen layouts—the U-type, the broken U, the two-wall kitchen, and the L-type. These figures are intended to serve as charts for reference in making decisions concerning clearances.

#### CLEARANCE UNDER WORK SURFACE

Although the average kitchen worker stands most of the time, two and possibly three provisions for sitting at work should be made, (1) on a stool at the sink, (2) at table or pull-out board just high enough to clear the worker's thighs when she sits on a chair with feet on floor (lap table), (3) at writing table, desk, or board.

In choosing a cabinet or pedestal sink or in planning the installation of a flat-rim sink it is desirable that the distance between the sink rim and the bottom of the construction below the sink rim should be kept to the minimum, to enable the worker to sit as close to the sink as possible.

To provide space for the worker's feet and legs, the open space under a table should be at least 18 inches wide and 16 inches deep. The top of the open space should be at least 25 inches from the floor or foot rest.\*

#### WIDTH AND PLACEMENT OF PULL-OUT BOARDS

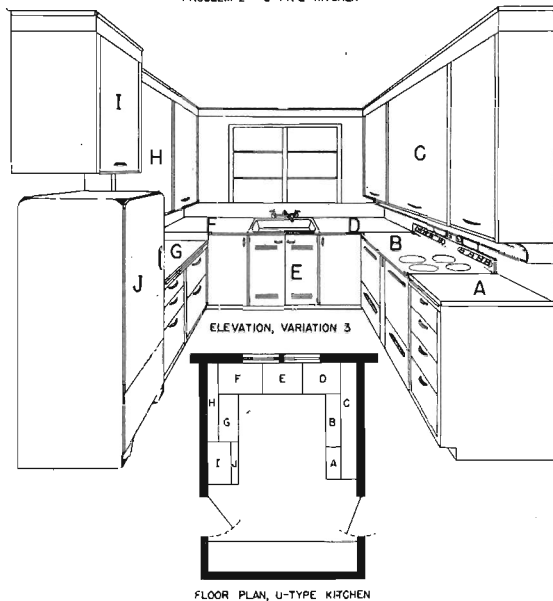
In the modern kitchen much of the actual work of food preparation is done on unfinished boards. Pastry is rolled out; bread kneaded; cookies and doughnuts rolled out and cut; meat, vegetables, bread, and cake sliced. For convenience these boards are kept in slots in base cabinets, may be used without removal, or placed on top of counter or table.

Pull-out boards used in place may be planned for other purposes than those enumerated in the foregoing paragraph. Such a

\* Oregon Experiment Station Bulletin 348, *Standards for Working Surface Heights and Other Space Units of the Dwelling*, Tables 12-14.

# CLEARANCES BETWEEN WALL AND BASE CABINETS

PROBLEM 1 U-TYPE KITCHEN



VARIATIONS	ASSUMPTIONS		HEIGHT OF BASE OF UPPER CABINET	CLEARANCES ALLOWED OVER WORK SURFACES
	HEIGHTS OF WORK SURFACES	DEPTH OF UPPER CABINETS		
1	A,B --- 36"	C --- 12"	C --- 54"	A,B,G --- 18"
	D,E, <sup>(1)</sup> F --- 38"	H --- 8"	H --- 50"	D --- 16"
	G --- 32"	I <sup>(2)</sup> --- 18"	I <sup>(3)</sup> --- 64"	F --- 12"
2	A,B --- 36"	C --- 12"	C --- 54"	A,B --- 18"
	D,E, <sup>(1)</sup> F --- 36"	H --- 12"	H --- 54"	D,F --- 18"
	G --- 36"	I --- 12"	I <sup>(3)</sup> --- 64"	G --- 18"
3	A,B --- 36"	C --- 12"	C --- 54"	A,B,D --- 18"
	D,E, <sup>(1)</sup> F --- 36"	H --- 8"	H --- 48"	F --- 12"
	G --- 32"	I <sup>(2)</sup> --- 18"	I <sup>(3)</sup> --- 64"	G --- 16"

## FOOTNOTES:

(1) HEIGHT OF SINK RIM.

(2) THIS WIDTH SHOULD NOT BE USED UNLESS THE CABINET IS EQUIPPED WITH

A ROLL-UP OR PUSH-UP DOOR.

(3) FOR CABINET ABOVE ELECTRIC REFRIGERATOR OF SIX-CUBIC-FEET CAPACITY.

RESEARCH IN AGRICULTURE AND HOME ECONOMICS	OREGON STATE COLLEGE CORVALLIS, OREGON	PLANNING KITCHEN CABINETS JULY 1946	DEPT. OF AG. ENG. & HOME ECON. OREGON AG. EXPERIMENT STATION
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Figure 3. Standards for height of space between base and wall cabinets in "U-type" kitchen.

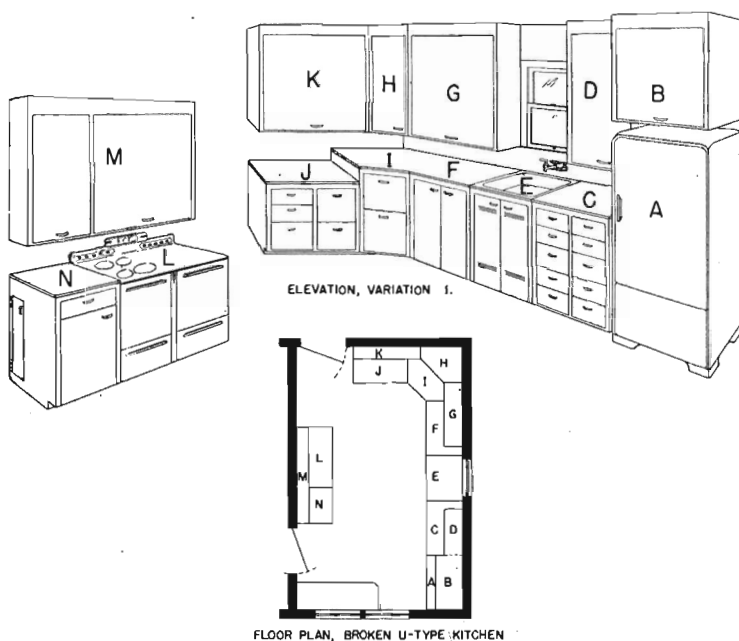
Variation 1. Heights of base cabinets at sink and mixing centers approximate averages of measures for work surfaces chosen by Oregon homemakers; depths of wall cabinets varied to suit intended uses.

Variation 2. All base cabinets 36 inches high; all wall cabinets 12 inches deep.

Variation 3. Mixing table height approximates average of choices; other surfaces 36 inches high. Depth of wall cabinets varied to suit intended uses.

# CLEARANCES BETWEEN WALL AND BASE CABINETS

## PROBLEM 2. BROKEN U-TYPE KITCHEN



VARIATIONS	ASSUMPTIONS		HEIGHT OF BASE OF UPPER CABINETS	CLEARANCES ALLOWED OVER WORK SURFACES
	HEIGHTS OF WORK SURFACES	DEPTH OF UPPER CABINETS		
1	L, N --- 36"	B <sup>(2)</sup> --- 18"	B <sup>(3)</sup> --- 64"	C, F, I --- 12"
	C, E <sup>(1)</sup> , F, I --- 38"	D, G --- 12"	D, G, H, K --- 50"	J --- 18"
	J --- 32"	K, M --- 8"	M --- 52"	L, N --- 16"
2	C, E <sup>(1)</sup> --- 36"	B, D --- 12"	B <sup>(3)</sup> --- 64"	C, F --- 16"
	F, I, J --- 36"	G, K --- 12"	D, G, H, K --- 52"	I, J --- 16"
	L, N --- 36"	M --- 12"	M --- 54"	L, N --- 18"

### FOOTNOTES:

- (1) HEIGHT OF SINK RIM.
- (2) THIS WIDTH SHOULD NOT BE USED UNLESS THE CABINET IS EQUIPPED WITH A ROLL-UP OR PUSH-UP DOOR.
- (3) FOR CABINET ABOVE ELECTRIC REFRIGERATOR OF SIX-CUBIC-FOOT CAPACITY.

RESEARCH IN AGRICULTURE AND HOME ECONOMICS	OREGON STATE COLLEGE CORVALLIS, OREGON	PLANNING KITCHEN CABINETS JULY 1946	DEPT. OF AGR. ENG. & HOME ECON. OREGON AGR. EXPERIMENT STATION
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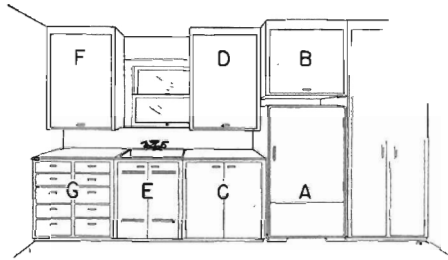
Figure 4. Standards for height of space between base and wall cabinets in "broken-U-type" kitchen with free-standing stove center.

Variation 1. Heights of base cabinets at sink and mixing centers approximate averages of measures for work surfaces chosen by Oregon homemakers; depth of wall cabinets varied to suit intended uses.

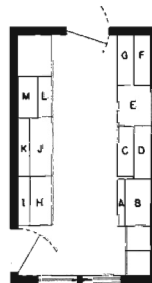
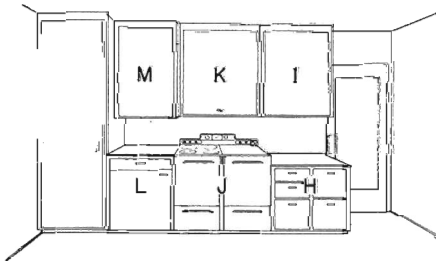
Variation 2. All base cabinets 36 inches high; all wall cabinets 12 inches deep.

# CLEARANCES BETWEEN WALL AND BASE CABINETS

## PROBLEM 3. TWO-WALL KITCHEN



ELEVATIONS, VARIATION 1.



FLOOR PLAN,  
TWO-WALL KITCHEN

VARIATIONS	ASSUMPTIONS		HEIGHT OF BASE OF UPPER CABINETS	CLEARANCES ALLOWED OVER WORK SURFACES
	HEIGHTS OF WORK SURFACES	DEPTH OF UPPER CABINETS		
1	C, E, G --- 38"	B <sup>(1)</sup> --- 18"	B <sup>(2)</sup> --- 64"	C, G --- 12"
	H --- 32"	D, F --- 12"	D, F --- 50"	H --- 20"
	J, L --- 36"	I, K --- 8"	I, K, M --- 52"	J, L --- 16"
		M --- 14"		
2	C, E, G --- 36"	B --- 12"	B <sup>(2)</sup> --- 64"	C, G --- 14"
	H --- 36"	D, F --- 12"	D, F --- 50"	H, J --- 18"
	J, L --- 36"	I, K, M --- 12"	I, K, M --- 54"	L --- 18"

### FOOTNOTES:

(1) HEIGHT OF SINK RIM.

(2) THIS WIDTH SHOULD NOT BE USED UNLESS THE CABINET IS EQUIPPED WITH A ROLL-UP OR PUSH-UP DOOR.

(3) FOR CABINET ABOVE ELECTRIC REFRIGERATOR OF SIX-CUBIC-FEET CAPACITY.

RESEARCH IN AGRICULTURE AND HOME ECONOMICS	OREGON STATE COLLEGE CORVALLIS, OREGON	PLANNING KITCHEN CABINETS JULY 1946	DEPT. OF AGR. ENG. & HOME ECON. OREGON AGR. EXPERIMENT STATION
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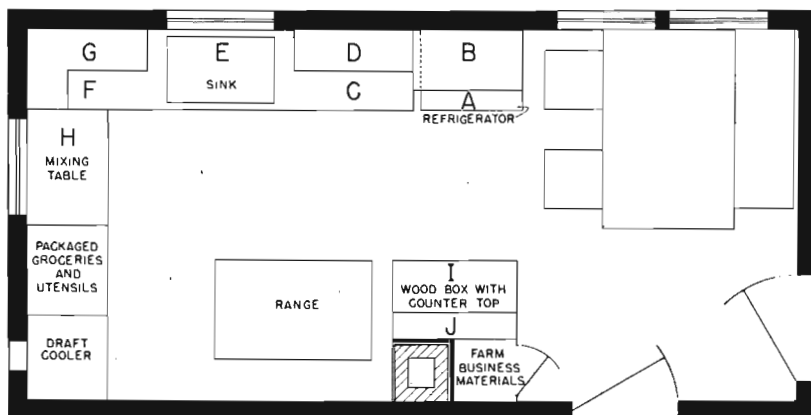
Figure 5. Standards for height of space between base and wall cabinets in "two-wall" kitchen.

Variation 1. Heights of base cabinets at sink and mixing centers approximate averages of measures for work surfaces chosen by Oregon homemakers; depth of wall cabinets varied to suit intended uses.

Variation 2. All base cabinets 36 inches high; all wall cabinets 12 inches deep.

# CLEARANCES BETWEEN WALL AND BASE CABINETS

## PROBLEM 4. L-TYPE KITCHEN, WITH COMBINATION RANGE



FLOOR PLAN, VARIATION 1

VARIATIONS	ASSUMPTIONS		HEIGHT OF BASE OF UPPER CABINETS	CLEARANCES ALLOWED OVER WORK SURFACES
	HEIGHTS OF WORK SURFACES	DEPTH OF UPPER CABINETS		
1	C, E, F --- 38"	B <sup>(2)</sup> --- 18"	B <sup>(3)</sup> --- 64"	C, F --- 12"
	H --- 32"	D, G --- 12"	D, G --- 50"	I --- 16"
	I --- 32"	J --- 8"	J --- 48"	
2	C, E, F --- 36"	B --- 12"	B <sup>(3)</sup> --- 64"	C, F --- 12"
	H --- 36"	D, G --- 12"	D, G --- 48"	I --- 18"
	I --- 36"	J --- 12"	J --- 54"	

### FOOTNOTES

- (1) HEIGHT OF SINK RIM
- (2) THIS WIDTH SHOULD NOT BE USED UNLESS THE CABINET IS EQUIPPED WITH A ROLL-UP OR PUSH-UP DOOR
- (3) FOR CABINET ABOVE ELECTRIC REFRIGERATOR OF SIX-CUBIC-FOOT CAPACITY

RESEARCH IN AGRICULTURE AND HOME ECONOMICS	OREGON STATE COLLEGE CORVALLIS, OREGON	PLANNING KITCHEN CABINETS JULY 1948	DEPTS. OF AGR. ENG. & HOME ECON OREGON AGR. EXPERIMENT STATION
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Figure 6. Standards for height of space between base and wall cabinets in "L-type" kitchen with combination wood and electric range.

Variation 1. Heights of base cabinets at sink and mixing centers approximate averages of measures for work surfaces chosen by Oregon homemakers; depths of wall cabinets varied to suit intended uses.

Variation 2. All base cabinets 36 inches high; all wall cabinets 12 inches deep.

board may serve as the place where the food chopper is attached, as a work table for the seated worker, as a writing desk, or as a step board for reaching the upper shelves in a storage cabinet.

Each type of board to be used without removal from the slot constitutes a specific construction problem. Factors to be considered are the need for holding the board firmly in place when in use, the amount of pressure on the board and its supports, and provision for cleaning.

Boards in slots immediately under the work counter may be planned for base cabinets containing either shelves or drawers. But for the sake of economy in construction costs as well as in the utilization of cabinet space, plans for boards that must be placed lower than just below the bottom of the apron should be restricted to base cabinets with drawers.

The various functions served by pull-out boards are listed in Table 4 together with the minimum desirable width of each, its preferred location with reference to the four kitchen centers, and a suggested height or range in heights for those to be used without removal from slot. So far as location is concerned, the pull-out boards are of two types:

1. Cutting boards, chopper board, and pastry board that is to be placed on top of a work surface when in use.
2. Pastry board to be used without removal from slot; writing board; lapboard; step board.

The front-to-back measure of the board should be as great as the depth of the cabinet permits. From the standpoint of convenience in use, the depth of the extension should be at least 16 inches.

If the board is intended to be used on top of a counter or table, then the position of the slot is unimportant, and it may be placed in space not usable for other purposes, such as in the apron immediately under the counter top or at the end of the cabinet.\* If the board is to be used in place (extended from its slot), then the same consideration should be given to its height as to that of any work surface.

The hardwood board for the food chopper may be widened and thickened slightly from front to back if put into its slot before the counter top is fastened into place. Care should be taken to test the amount of pull-out, which should be 14 inches if the food chopper is to be fastened on the side of the board. A 10-inch extension permits placing a pan on the board (to catch the food being ground) when the chopper is fastened on the end. If the shape of the chopper permits placing the pan on the work counter above the board, the pull-

\* See Oregon Experiment Station Circular 131, *Planning the Kitchen*, p. 11, Figure 8 B.

out need not be over two to four inches. The latter scheme is probably the best arrangement for the self-wedging board.

Care must be taken to locate the chopper board where the worker will have space to turn the handle of the chopper. Standards for the placement of this pull-out board are as follows:

1. When the grinder is to be attached to side of board (assumes worker stands facing end of board), the minimum distance from either side of board to wall should be 16 inches; and the minimum distance from either side of board to base cabinet, 10 inches.

2. When the grinder is to be attached to end of board (assumes operator stands facing side of board), the minimum distance from edge of board to wall or base cabinet should be 21 inches.

Care should also be taken in the placement of the pastry board to insure elbow room for the worker. A minimum of 5 inches between edge of board and the wall or a high cabinet is desirable.

Figure 7 illustrates the placement and use of the various types of pull-out boards.

Table 4. WIDTH AND PLACEMENT OF PULL-OUT BOARDS.

Use	Width of board	Location <sup>1</sup>	Height <sup>2</sup>
	<i>Inches</i>		<i>Inches</i>
Bread and pastry making .....	18 to 22 <sup>3</sup>	Mixing table	33½
Vegetable cutting .....	14	Sink	30 to 38
Meat cutting .....	14	Range	30 to 38
Bread and cake cutting .....	14	Serving table	30 to 38
Writing .....	24	Unassigned	28
Lapboard—work surface for seated worker .....	14 to 30 <sup>3</sup>	Unassigned	24 to 26
Step board—to reach high shelves .....	12	Unassigned	12
Hardwood board—to attach food chopper .....	4 or 9 <sup>4</sup>	Unassigned <sup>5</sup>	32 to 36

<sup>1</sup>Center near which it is desirable to install board.

<sup>2</sup>Distance of top of board from floor of room, if intended to be used in place (see Table 2).

<sup>3</sup>Amount depends upon the uses to be made of the board. Wider boards are more varied in possible uses.

<sup>4</sup>First width is for the situation in which pan to catch food may be placed on an adjacent pull-out board or on counter top above. Second width permits flat pan (as pie tin) to be placed on the board to which the chopper is fastened.

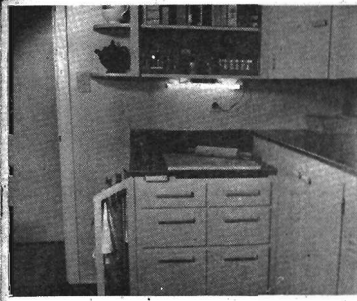
<sup>5</sup>The hardwood board should be located with its side 27 inches from a wall or cabinet parallel to it.

## STANDARDS FOR STORAGE AREAS

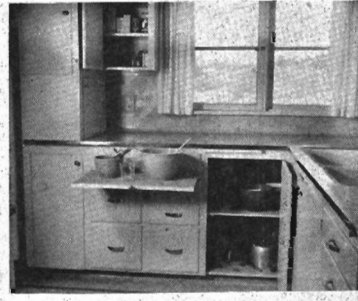
### LIMITATIONS OF STORAGE SPACE

The extent of reach and the eye height of the worker set the limits of storage space suitable for articles in frequent use. Recommendations for these limits from the standpoint of the needs of the majority of women are listed in Table 5 and illustrated by Figure 8.

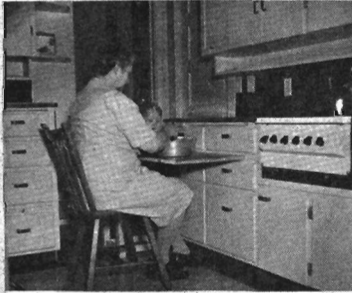




A. PASTRY BOARD USED ON TOP OF WORK TABLE.



B. PASTRY BOARD SET A HEIGHT FOR USE IN PLACE.



C. A LAP BOARD ENCOURAGES THE HOMEMAKER TO SIT WHILE DOING CERTAIN TASKS.



D. A STEP BOARD ADDS 12" TO THE REACHABLE HEIGHT OF A WALL CABINET.



E. BOARDS ARE NEEDED FOR SLICING VEGETABLES, MEAT, AND BREAD.



F. HARDWOOD BOARD FOR FOOD GRINDER WEDGES WHEN PULLED OUT 10".

Figure 7. Placement and use of pull-out boards.

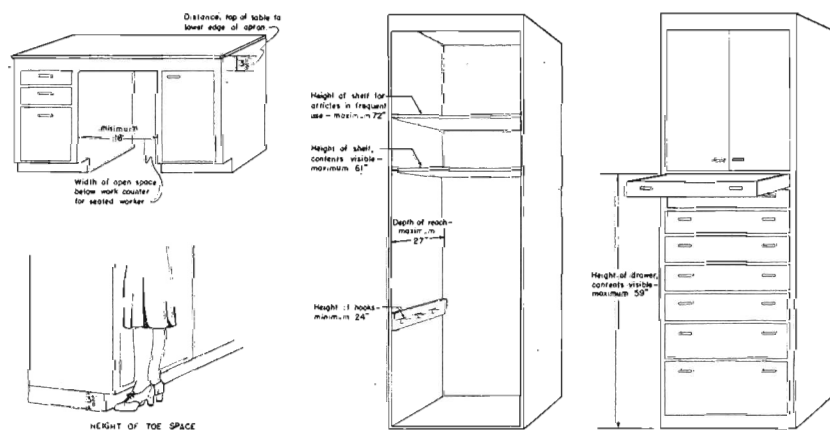
Table 5. REQUIREMENTS OF WORKER THAT LIMIT THE STORAGE SPACE IN A CABINET.<sup>1</sup>

Measure	Dimension
	<i>Inches</i>
Minimum height of toe space .....	3
Minimum width (side to side) of open space below table, for seated worker .....	18
Maximum distance from top of table (for seated worker) to lower edge of apron .....	3 $\frac{1}{2}$
Maximum depth of reach in cabinet .....	27
Maximum height of shelf or hook for articles in frequent use .....	72
Maximum height of shelf, contents visible .....	61
Maximum height of top of drawer .....	59
Minimum height of hook .....	24

<sup>1</sup>Adapted from measures contained in Oregon Experiment Station Bulletin 348, *Standards for Working Surface Heights and Other Space Units of the Dwelling*.

Generally speaking, while kitchen cabinets should be so planned that the majority of women can use them with a reasonable degree of comfort, wherever possible the needs of the marginal worker (for example, the very tall or very short) should be given consideration also. The application of this principle is treated later in the discussions of specific types of cabinets.

Other considerations in planning storage cabinets are the space taken up by the material used in them, and limitations in the utilization of the space available for storage that are a consequence of the way the cabinet is constructed. Allowances for dimensions of materials are given in Appendix Table 1. Assumed or recommended construction practices have been listed on pages 17 and 18.



RESEARCH IN AGRICULTURE  
AND HOME ECONOMICS

OREGON STATE COLLEGE  
CORVALLIS, OREGON

PLANNING KITCHEN CABINETS  
JULY 1946

DEPT. OF AGR. ENG. & HOME ECON.  
OREGON AGR. EXPERIMENT STATION

Figure 8. Requirements of worker that limit amount and utilization of storage space in a cabinet.

### UNIT MEASURES

In this section there are listed minimum measures for depth, width, and height of spaces planned for the storage of specific articles or groups of articles. In determining these measures, there were taken into account not only the dimensions of the stored materials, but also allowances for hand action in placement and removal, and in some cases, disorder allowances. Standards for these allowances are given on page 15.

#### Shelving for Food Equipment and Supplies

Appendix Table C-1 gives the unit measures for shelving planned for dishes and articles that may be stored with them, including minimum desirable depth of closed compartment or of open shelving, the allowance for length of shelf space, and the minimum desirable distance between shelves.

The dish cabinet should be  $11\frac{1}{2}$  inches deep for dinner plates. This measure suffices for all articles except the largest platters, salad bowls, and trays. Space that is as much as  $13\frac{1}{2}$  inches deep is needed for these articles.

Since minimum clearance over stacks is less when the shelf above is half-width than when it is full width, the use of half-shelves is economical of vertical space. Dishes up to seven inches in diameter can be safely stored on shelves half as wide as those needed for dinner plates.

If dinner plates, sauce dishes, cups, and serving dishes are kept in a warming cabinet, this should be at least  $13\frac{1}{2}$  inches deep to accommodate the largest platters, and  $11\frac{1}{2}$  inches, if these are excluded. A compartment  $10\frac{1}{2}$  inches deep will accommodate the dishes that are not warmed before using. Luncheon trays require a depth of  $13\frac{1}{2}$  inches.

Because the heights of dishes vary so much, adjustable shelves are necessary to insure maximum economy and flexibility in the use of space.

Appendix Table C-2 lists unit measures for the shelving needed for utensils and other articles used in food preparation. Most of the utensils listed are those that constitute an adequate set for the average Oregon farm home where cooking is usually done for four to six persons.\* If all utensils (except those for which storage in the kitchen is not advised) are stored in one floor-to-ceiling cabinet, its minimum depth should be 17 inches. The shelves in this cabinet may vary in width, leaving hanging space on the door and along the sides.

\* Oregon Experiment Station Circular 134, *A Set of Utensils for the Farm Kitchen*.

In Appendix Table C-3 there are listed the shelf requirements of packaged supplies commonly sold in stores patronized by Oregon farm families, also shelf provision for recipe books and recipe card file. The minimum width of an open shelf or depth of a closed compartment suitable for all packaged supplies is 10 inches. A cabinet intended only for supplies used in cooked foods may be  $7\frac{1}{2}$  inches deep. Because of variations in heights of packages and the possibility of changes in family practices in buying packaged foods, adjustable shelves for these commodities are highly desirable.

Appendix Table C-4 gives the unit measures of shelving for the various types of containers in common use for storing food materials on shelves. These are used particularly for home-grown foods, for foods purchased in containers that are not suitable for storing in the opened package, and for left-overs. The data in this table will be found useful for reference in planning pantries and food storage closets for situations where bottles, cans, pails, etc., are commonly used as storage containers.

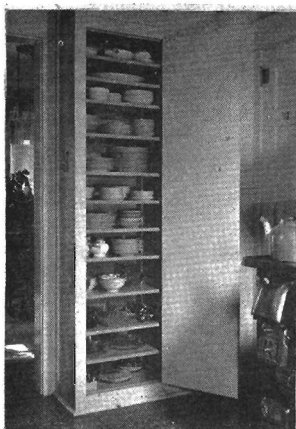
Figure 9 illustrates cabinets planned for dishes, packaged foods, skilletts, and dish-washing supplies and equipment.

For convenience in reference, minimum depths of cabinets for various groups of articles have been assembled below in Table 6. A wall cabinet need not be over  $11\frac{1}{2}$  inches deep, a lower cabinet 20 inches, or a floor-to-ceiling cabinet 17 inches. A cabinet above the range and a cabinet used for packaged groceries may be  $7\frac{1}{2}$  inches deep. Sink supplies may be stored in a studding cabinet.

Table 6. MINIMUM DESIRABLE WIDTH OF OPEN SHELVING OR DEPTH OF COMPARTMENT FOR VARIOUS GROUPS OF STORED MATERIALS.<sup>1</sup>

Item	Minimum width of shelf
	<i>Inches</i>
Baking utensils .....	13
Beverage makers; foods used at stove .....	$7\frac{1}{2}$
Bowls, measures, and tools used at mixing table .....	14
Canning equipment .....	17
Cleaning supplies, sink center .....	$4\frac{1}{2}$
Containers—capacity 10 pounds .....	9
Containers—capacity 25 pounds .....	11
Containers—capacity 50 pounds .....	16
Dishes used in family meal service .....	$11\frac{1}{2}$
Electrical appliances used at meal table .....	11
Foods assigned to draft cooler .....	$8\frac{1}{2}$
Kettles, saucepans, etc. ....	16
Packaged foods used in cooked dishes .....	$7\frac{1}{2}$
Ready-to-serve foods .....	10
Skilletts .....	20
Trays, large platters .....	$13\frac{1}{2}$
Utensils used at sink .....	16

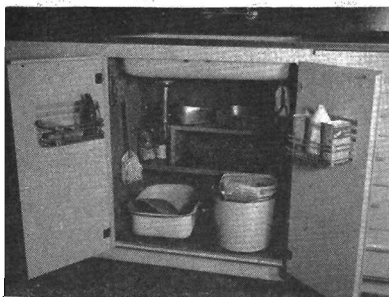
<sup>1</sup>Excludes small utensils kept on trays.



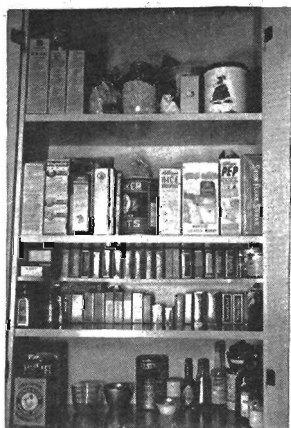
A. CABINET PLANNED FOR COMPANY DISHES. SHELVES ARE ADJUSTABLE.



B. CABINET PLANNED FOR SKILLETS AND ROASTER. SHELVES ARE COVERED WITH LINOLEUM.



C. USE OF SPACE UNDER SINK FOR STORAGE OF DISH WASHING EQUIPMENT AND SUPPLIES. TOP SHELF REMOVABLE.



D. CABINET PLANNED FOR PACKAGED FOODS. NOTE U-SHAPE OF UPPER SPICE SHELF.

Figure 9. Cabinets with shelves, planned for the storage of specific articles.

### Hanging Space for Utensils

A cabinet for hanging utensils that is part of the stove center should be at least 14 inches wide, when both sides are used, and  $13\frac{1}{2}$  inches deep. Corresponding inside measures are 22 inches and 16 inches for a cabinet designed as a part of the sink center for utensils that can be hung.

A drawer for hanging stove-center utensils, assuming its use for one row of utensils, should be at least 5 inches wide and 21 inches

high (inside measure). Corresponding measures for a drawer used for hanging utensils allocated to the sink center are 10 inches and  $20\frac{1}{2}$  inches, respectively.

In Appendix Table C-5 utensils are listed that are equipped for hanging, and allowances needed for hanging space are given for each one.

### Slots for Flat Utensils and Shallow Dishes

Shallow dishes and utensils may be conveniently and economically stored in compartments with vertical or horizontal slots. Vertical slots may be formed by dividers in drawers or between shelves; horizontal slots, by setting two vertical dividers between shelves and subdividing the intervening space by means of lightweight shelves, or by setting shelves close together.

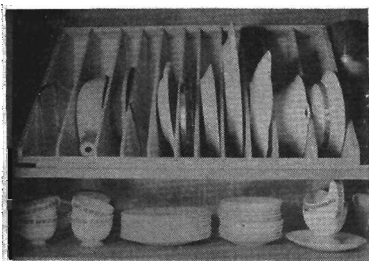
Appendix Table C-6 gives the dimensions of slots in relation to specific uses. The minimum widths of individual slots placed horizontally vary from 2 to 5 inches for the items listed in this table; vertical slots vary from 2 to 4 inches.

Ideally, only one article will be assigned to a given space except when they are placed or removed at the same time (as a set of layer-cake pans). However, variations in the width of slots in a specific cabinet should be few in number, and differences in width should be large enough to be readily detected, or the slot section of the cabinet will not be easy to keep in order.

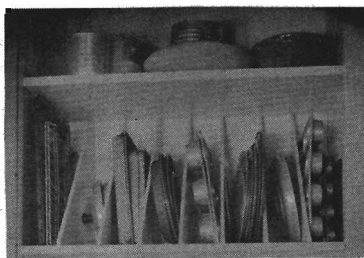
As the basis for the other two dimensions of the slot compartment, four sets of unit measures are given for each item in the list. They apply to horizontal and to vertical slots, and to the situation in which the utensil or dish is stored with its width (shorter horizontal measure) at right angles to the edge of the shelf as well as that in which this measure parallels the edge. These data indicate that for economy in the use of space there should be at least two sets of slots in the kitchen. When these sections are in the form of vertical slots between shelves, one may be located in a wall cabinet that is at least  $11\frac{1}{2}$  inches deep; 14 inches is a good height for this section. The slots for larger utensils may be placed in a base cabinet; these slots should be 20 inches high.

If used for storage in slots, a drawer will need to be 14 inches high (inside) to accommodate any article listed in Appendix Table C-6. A drawer for flat utensils used at the mixing center needs to be only 11 inches high if cookie sheets are stored elsewhere.

For ready conversion of drawer or shelf to new uses, as well as for ease of cleaning, slot sections or dividers should be removable.



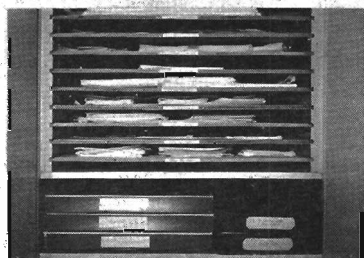
A. MOVABLE PAN OR DISH FILE SET ON SHELF. FRONT EDGE RAISED TO PREVENT ROUND OBJECTS FROM ROLLING OUT.



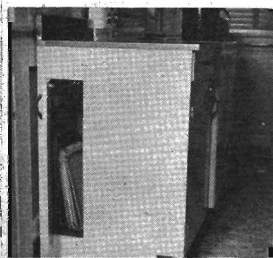
B. FIXED VERTICAL DIVIDERS BETWEEN SHELVES. NOTE SHAPE OF DIVIDER.



C. FIXED DIVIDERS IN DRAWER. WIDTH OF DIVIDERS 6".



D. HORIZONTAL DIVIDERS BETWEEN SHELVES ARE USEFUL FOR TABLE MATS, TABLE LINEN, AND FLAT DISHES.



E. USE OF SPACE AT END OF BASE CABINET FOR BAKING SHEETS AND TRAYS.



F. SLOTS IN END OF WALL CABINET.



G. MOVABLE UNDER-SINK FILE FOR DISH WASHING EQUIPMENT.

Figure 10. Slots for flat utensils and shallow dishes.

They may be made as separate compartments and set into place in a drawer or on a shelf.

For situations where vertical space is at a greater premium than lateral space, dividers may be set on the diagonal. For example, if

it is desired to reduce the space between shelves from 14 inches to 12 inches, it may be accomplished by setting the dividers at an angle of about  $58^\circ$ . This will require an additional shelf length of  $7\frac{1}{2}$  inches for the triangular waste space at one end and an increase in the width of each slot of about  $\frac{1}{2}$  inch. For a reduction of vertical space from 20 to 18 inches, the dividers would need to be set at an angle of about  $64^\circ$ , and the additional shelf length would be  $8\frac{1}{2}$  inches, plus  $\frac{1}{2}$  inch for each slot.

Figure 10 includes illustrations of slots for shallow dishes and utensils, including a removable inset placed on a shelf, fixed dividers between shelves, a divided drawer, an under-sink holder for dish pans, and a place for cookie sheets and trays. It also includes a linen file and slots at the end of a wall cabinet.

### Drawers and Trays for Small Utensils

In planning for the storage of small utensils it is difficult to reconcile the requirements of convenience in use with those of space economy, provision for changes in type or design of small utensils, and preferences of homemakers. In designing the kitchen it is a good plan to allow space for these items in drawers or in trays to be set on shelves, even if special purpose arrangements, such as rack on wall, are made for some of them.

In Table 7 there are listed two sets of recommendations for the inside measures of drawers and trays that are adequate for the storage of specified sets of utensils. In Series A, provision is made for all small utensils listed in Appendix Table C-7. Utensils that are equipped for hanging were omitted from Series B. The combined widths of drawers and trays in Series A varies from 51 inches to 56 inches; in Series B, 27 inches to 36 inches.

Plans A-1 and B-1 are suitable for the situation in which there are utensil drawers for the three centers—sink, range, and mixing table. No drawer was planned for the serving center, as all utensils but one on the list (bread knife), are also used at other centers. For the storage of all small utensils assigned to the center, one drawer 15 inches wide (inside), would be needed at the sink and a drawer 15 inches wide at the stove. More space is required at the mixing table, 21 inches if all utensils are in one drawer, or two 11-inch drawers.

Plans A-2 and B-2 apply to the situation in which it is desirable to store utensils in a tier of three drawers; plans A-3 and B-3, in trays on the shelves of a floor-to-ceiling cabinet 16 inches deep; and plans A-4 and B-4, in the two top drawers under a sink work counter, with a tray in a floor-to-ceiling or base cabinet to accommodate the overflow.



Patterns for the sectioning of the drawers and trays needed for Plan Series A in Table 7 are illustrated by Figure 11. The only utensils for which individual storage is provided are the rotary beater, the rolling pin, and the knives and other articles for which cuts in a block are adequate. The prepositioning of all items would require considerably more drawer space than is specified in these plans.

Table 7. DIMENSIONS OF DRAWERS AND TRAYS PLANNED FOR SPECIFIED GROUPS OF SMALL UTENSILS.

Storage provision			Minimum inside dimensions <sup>1</sup>		
Plan and description	Unit and location	Depth <sup>2</sup>	Width <sup>3</sup>	Height <sup>4</sup>	
<i>All utensils</i>		<i>Inches</i>	<i>Inches</i>	<i>Inches</i>	
A-1 Drawer space at each counter	a. Drawer near sink	21	15	3	
	b. Drawer near range	21	15	4	
	c. Near mixing table— if one drawer	21	21	4	
A-2 Tier of drawers	if two drawers, each	21	11	4	
	a. Top drawer	21	17	3	
	b. Middle drawer	21	17	4	
A-3 Trays on shelf	c. Bottom drawer	21	17	4	
	a. Tray nearest sink	16	12	4	
	b. Second tray	16	12	4	
A-4 Two drawers under work counter, remainder in tray in storage cabinet	c. Third tray	16	14	4	
	d. Fourth tray	16	13	4	
	a. Drawer nearest sink	21	15	4	
	b. Other drawer	21	15	4	
	c. Tray	16	22	4	
<i>Utensils not equipped for hanging</i>					
B-1 One drawer at each center	a. Drawer near sink	21	9	3	
	b. Near range	21	9	3	
	c. Near mixing table	21	9	4	
B-2 Tier of drawers	a. Top drawer	21	9	3	
	b. Middle drawer	21	9	3	
	c. Bottom drawer	21	9	4	
B-3 Trays on a shelf	a. Tray nearest sink	16	9	3	
	b. Second tray	16	13	3	
	c. Third tray	16	9	4	
B-4 Two drawers under 37-inch work counter; remainder on tray in floor-to-ceiling cabinet	a. Drawer nearest sink	21	15	3	
	b. Other drawer	21	15	3	
	c. Tray	16	5	4	

<sup>1</sup>Assumes utensils stored in sectional drawers and trays in a manner convenient for handling. Dimensions were determined by experimentation.

<sup>2</sup>The approximate maximum inside front-to-back measures of drawers and trays in cabinets with over-all measures of 24 inches and 18 inches.

<sup>3</sup>Adjusted to stock size (width).

<sup>4</sup>Inside height of drawer, or distance between shelves upon which tray is placed.

## Drawers and Trays for Table Silver

The minimum desirable inside vertical measure (height of drawer, or clearance above tray) is 3 inches where 12 pieces of table silver that are duplicates (as knives) are to be stored. A good height for dividers is 1½ inches. The minimum desirable width of a

# DRAWER INSETS SECTIONED FOR SMALL UTENSILS

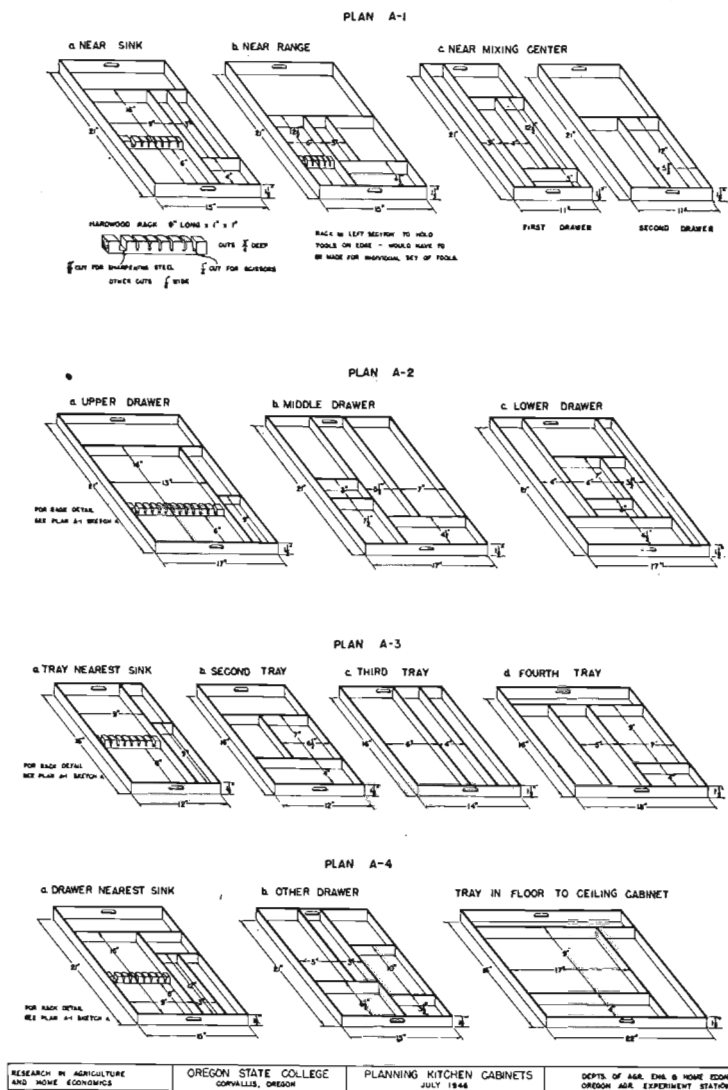


Figure 11. Patterns for sectioning drawer insets or trays intended for small utensils.

- Plan A-1. For situation in which there is 1 utensil drawer near the sink, 1 drawer near the stove, and 2 drawers near the mixing table.
- Plan A-2. For situations in which all small utensils are assigned to a tier of drawers.
- Plan A-3. For situation where all small utensils are kept in trays in a storage cabinet.
- Plan A-4. For the installation permitting 2 utensil drawers under a work counter, with the remainder of the utensils stored in a tray in a storage cabinet.

section, for freedom of hand action, is 3 inches if next to side or end of drawer,  $2\frac{1}{2}$  inches if between dividers that are  $1\frac{1}{2}$  inches high. This width is sufficient for all articles except knives and the larger single pieces, for which a section width of 4 inches is desirable. Section lengths vary from 6 inches to 13 inches. (See Appendix Table C-8.)

Table 8 gives the inside dimensions of drawers and trays planned for four, six, and ten sections. When the four sections are fitted into a drawer 21 inches deep, it will need to be 11 inches wide, but if the space is only 16 inches deep, a width of 13 inches is required. Comparable measures for width of drawer or tray containing six sections are 13 inches and 15 inches; ten sections, 17 inches and 19 inches. Patterns for these six plans are shown by Figure 12.

Table 8. DIMENSIONS OF DRAWERS AND TRAYS PLANNED FOR THE STORAGE OF TABLE SILVER, IN RELATION TO NUMBER AND INTENDED USES OF SECTIONS.

Number sections	Intended uses	Inside dimensions			Plan number
		Depth	Width	Height	
		<i>Inches</i>	<i>Inches</i>	<i>Inches</i>	
4.....	Knives, forks, spoons, single pieces <sup>1</sup>	21	11	3	A-1
		16	13	3	A-2
6.....	Knives, forks, tablespoons, teaspoons salad forks, small pieces <sup>1</sup>	21	13	3	B-1
		16	15	3	B-2
10.....	Knives, forks, tablespoons, teaspoons, dessert spoons, bouillon spoons, salad forks, butter spreaders small single pieces, large single pieces	21	17	3	C-1
		16	19	3	C-2

<sup>1</sup>Single pieces include butter knife, pickle fork, cream ladle, sugar spoon, jelly spoon, sugar tongs, meat fork, berry spoon, gravy ladle, and servers.

### Drawers and Trays for Kitchen Textiles

In Appendix Table C-9 there are given data needed in planning drawers for the storage of kitchen textiles and articles that may be stored with them. Because of the differences in form and size of these articles, and because it does not matter very much how textiles are folded, the arrangements for their storage may vary widely.

For convenience in arranging the various articles in this category as well as for adequacy of storage, it is desirable to provide the equivalent of six drawers, 21 inches deep, 10 inches to 13 inches wide, and from 4 to 7 inches high (inside measures). The position of textile drawers in the kitchen ensemble is relatively unimportant, compared with drawers for utensils and food supplies, but ideally two of these drawers will be located near the sink, one near the mixing table, and two near the meal table.

## SECTIONED INSETS FOR TABLE SILVER

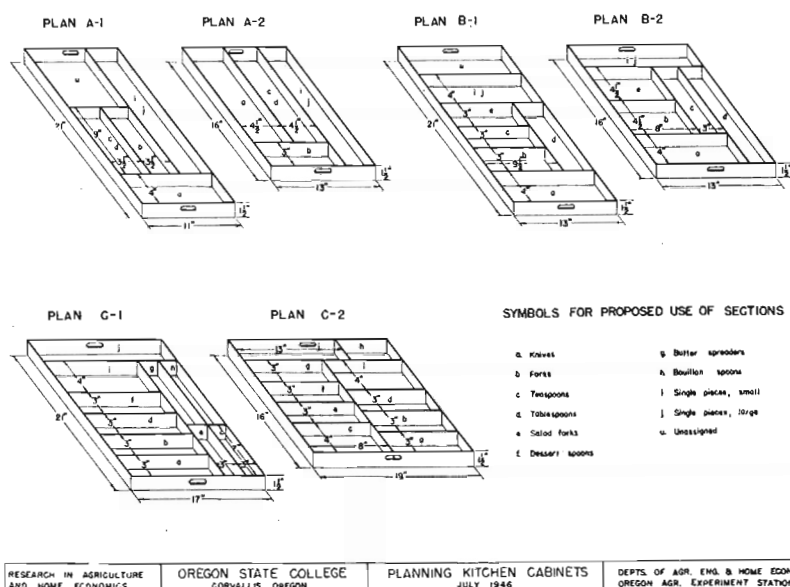


Figure 12. Patterns for sectioning drawer insets or trays to accommodate table silver. Arrangements of 4, 6, and 10 sections in spaces that are 21 inches deep and 16 inches deep, respectively.

## Drawers for Food Storage

Foods that may be stored in drawers and bins fall in four categories: (1) flour, sugar, and other staples for which protection from dust and infestation is very important; (2) nuts; dried fruits and vegetables that are washed before cooking; (3) foods for which a temperature lower than that of the room is desirable (apples, potatoes); (4) bread and cake.

Unit measures for drawers intended to be used as bins for the foods in the first two categories listed in the foregoing paragraph are based on the cubic inches in specified amounts and the desirable margin in inside height of drawer over height of contents when at the maximum. These data are given in Appendix Table C-10 for

21 commodities. For these foods the space required for a pound varies from 23 cubic inches for salt to 84 cubic inches for rolled oats. White flour requires 49 cubic inches, or about 50 per cent more space than does granulated sugar.

Rice, beans, and coarse cereals require about the same amount of space as granulated sugar. The storage requirement of white flour is only slightly larger than that for grits, cornmeal, raisins, or brown sugar.

Homemakers customarily add a new supply of a much-used food, as flour or sugar, before the bin is empty. Hence, bin sizes need to provide for more than the size of the unit of purchase. Suggested bin capacities are 6, 12, 30, 60, and 110 pounds, when the amounts habitually purchased at one time are 5, 10, 25, 50, and 100 pounds, respectively.

Table 9 gives the approximate capacities, for white flour and granulated sugar, of drawers of two widths and of various heights. These capacities apply to drawers that are 21 inches deep; they may be applied to shallower drawers by discounting them 5 per cent per inch of depth. The first set of data are intended for use in designing base cabinets with drawers that are 12 inches wide, overall; the second set apply to drawers with an over-all width of 16 inches.

Table 9. APPROXIMATE CAPACITIES OF FLOUR AND SUGAR DRAWERS IN RELATION TO INSIDE DIMENSIONS.

Inside height of drawer	Approximate capacity in pounds per drawer <sup>1</sup>					
	Inside drawer depth 21 inches <sup>2</sup> Width 10½ inches <sup>3</sup>			Inside drawer depth 21 inches <sup>2</sup> Width 14½ inches <sup>4</sup>		
	White flour		Sugar	White flour		Sugar
	2-inch margin	6-inch margin		2-inch margin	6-inch margin	
Inches	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
6.....	22	....	37	31	....	42
7.....	27	....	43	37	....	51
8.....	31	....	50	44	....	60
9.....	36	....	57	50	....	69
10.....	40	22	63	56	31	78
11.....	45	27	70	62	37	88
12.....	49	31	77	....	44	97
13.....	54	36	83	....	50	106
14.....	58	40	90	....	56	....
15.....	....	45	97	....	62	....
16.....	....	49	103	....	....	....
17.....	....	54	110	....	....	....
18.....	....	58	....	....	....	....

<sup>1</sup>Calculations made from data in Appendix Table C10. Capacities approximating 30 and 60 pounds of flour, and 60 and 110 pounds of sugar are in italics.

<sup>2</sup>For shallower drawers discount these figures 5 per cent per inch of length.

<sup>3</sup>Over-all width of drawer 12 inches, when thickness of sides is three-fourths of an inch.

<sup>4</sup>Over-all width of drawer 16 inches, when thickness of sides is three-fourths of an inch.

In Table 10 there are given the dimensions of drawers suitable for 30-pound and 60-pound lots of granulated sugar, prunes, white flour, whole-wheat flour, filberts and walnuts, and for 110-pound lots of granulated sugar.

Table 10. INSIDE DIMENSIONS OF DRAWERS SUITABLE FOR SELECTED COMMODITIES IN LARGE AMOUNTS.

a. 30-pound lots

Inside width and depth of drawer <sup>1</sup>	Inside height of drawer suitable for storage of 30-pound lots <sup>2</sup>					
	Granulated sugar	Prunes	White flour <sup>3</sup>	Whole wheat flour <sup>3</sup>	Filberts	Walnuts
<i>Inches</i>	<i>Inches</i>	<i>Inches</i>	<i>Inches</i>	<i>Inches</i>	<i>Inches</i>	<i>Inches</i>
8½ x 17.....	8½	9½	12	13½	17½	18½
10½ x 17.....	7	8	10	11	14½	15½
12½ x 17.....	6	7	9	9½	12	13½
14½ x 17.....	5½	6½	8	8½	10½	11½
16½ x 17.....	5	6	7	8	9½	10½
8½ x 21.....	7	8	10	11	14½	15½
10½ x 21.....	6	7	8½	9½	12	13
12½ x 21.....	5	6	7½	8	10	11
14½ x 21.....	4½	5½	7	7½	9	10

b. 60-pound lots; 110-pound lots of granulated sugar

Inside width and depth of drawer <sup>1</sup>	Inside height of drawer suitable for storage of 60-pound lots <sup>2, 4</sup>						Inside height of drawer for 110 pounds sugar
	Granulated sugar	Prunes	White flour <sup>3</sup>	Whole wheat flour <sup>3</sup>	Filberts	Walnuts	
<i>Inches</i>	<i>Inches</i>	<i>Inches</i>	<i>Inches</i>	<i>Inches</i>	<i>Inches</i>	<i>Inches</i>	<i>Inches</i>
8½ x 17.....	15	17½	22	23+	23+	23+	23+
10½ x 17.....	12½	14½	18½	20½	23+	23+	21½
12½ x 17.....	11	12½	15½	17½	23	23+	18½
14½ x 17.....	9½	11	14	15½	20	21½	16
16½ x 17.....	8½	10	12½	13½	18	19	14½
18½ x 17.....	8	9	11½	12½	16	17½	13
8½ x 21.....	12½	14½	18½	20½	23+	23+	21½
10½ x 21.....	10½	12	15	17	22	23+	18
12½ x 21.....	9	10½	13	14½	19	20½	15½
14½ x 21.....	8	9½	11½	13	16½	18	13½
16½ x 21.....	7	8½	10½	11½	14½	16	12
18½ x 21.....	6½	7½	9½	10½	13	14½	11

<sup>1</sup>For over-all measures of drawer add 1½ inches to the width, 1 inch to the depth, and 1 inch to the inside height.

<sup>2</sup>Calculated from data in Appendix Table C10.

<sup>3</sup>Two-inch margin over contents.

<sup>4</sup>Maximum practical inside height of drawer, 23 inches (over-all 24 inches). Measures greater than this height are indicated by plus signs.

Drawers containing two or more sections are often more economical than individual drawers for foods purchased in relatively small lots, as well as more readily converted to new uses. Preferably these sections will be individual metal bins, each with its own lid. The inside dimensions of a drawer containing insets should allow enough clearance to permit easy removal of any one of them.

Suggested minimum inside dimensions of a section are 5 inches for width, 10 inches for depth, and 4 inches for height. The suggested maximum inside height of a section is 11 inches.

Table 11 gives the approximate capacities of the sections in drawers 10½ inches and 14½ inches wide, and 21 inches deep (inside measures), and of various heights, when the space in the drawer is used for two equal sections and for three sections. These data are intended for use in designing base cabinets with drawers having overall widths of 12 inches and 16 inches.

Capacity is given in terms of white flour and granulated sugar, and for salt and rolled oats, the heaviest and the lightest of the 21 dry foods listed in Appendix Table C-10.

Table 11. APPROXIMATE CAPACITY FOR SPECIFIC FOODS OF SECTIONS 21 INCHES DEEP AND 10½ INCHES AND 14½ INCHES WIDE (INSIDE MEASURES) IN RELATION TO INSIDE HEIGHT AND NUMBER OF SECTIONS IN DRAWERS.

Inside dimension of drawer		Approximate capacity in pounds per section <sup>1</sup>							
		Two sections				Three sections			
		White flour	Granulated sugar	Rolled oats	Salt	White flour	Granulated sugar	Rolled oats	Salt
Width <sup>2</sup>	Height	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
Inches	Inches	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
10½	5	....	....	....	18	....	....	....	12
10½	6	9	13	6	23	6	9	4	15
10½	7	11	16	7	27	7	11	4	18
10½	8	13	19	8	32	8	13	5	21
10½	9	15	22	9	37	10	16	6	24
10½	10	17	25	11	41	11	18	7	27
10½	11	19	29	12	46	13	20	8	30
14½	5	....	....	....	26	....	....	....	16
14½	6	12	20	8	32	7	12	5	20
14½	7	15	25	10	38	9	15	6	25
14½	8	18	29	11	45	11	18	7	29
14½	9	21	33	13	51	13	21	8	33
14½	10	24	38	15	58	15	23	10	37
14½	11	27	42	17	64	17	26	11	41

<sup>1</sup>Calculations made from data in Appendix Table C-10 for cases within recommended limits, namely:

Minimum height of material in drawer, any commodity—4 inches.

Maximum height of section in drawer of two or more sections—11 inches.

For shallower drawers discount these figures 5 per cent per inch of depth.

<sup>2</sup>See Table 8, footnotes 3 and 4.

Appendix Tables C-11 to C-13 contain additional information applying to the problem of dimensioning and sectioning food drawers. Recommendations for the number and sizes of sections in drawers of various sizes are given, and the adequacy of these sections is shown for depths of 5 to 11 inches in terms of 6-pound and 12-pound lots of the commodities listed in Appendix Table C-10. The adequacy of undivided drawers of various sizes is shown in terms of 12-pound and 30-pound lots.

Table 12 lists the inside measures of drawers or sections intended for the storage of apples, potatoes, and other long-keeping fruits and vegetables. Suitable provision for the storage of these commodities would be two drawers of two sections each.

Table 12. APPROXIMATE CAPACITY OF DRAWERS AND DRAWER SECTIONS INTENDED FOR THE STORAGE OF LONG-KEEPING FRUITS AND VEGETABLES.

Inside dimensions <sup>1</sup>		Approximate capacity <sup>2</sup>	
Width	Height	When inside depth is 17 inches	When inside depth is 21 inches
<i>Inches</i>	<i>Inches</i>	<i>Pounds</i>	<i>Pounds</i>
5	6	7	9
5	7	9	12
5	8	11	14
5	9	13	16
5	10	15	19
5	11	17	21
6	6	9	11
6	7	11	14
6	8	13	17
6	9	16	20
6	10	18	22
6	11	20	25
7	6	11	13
7	7	13	16
7	8	16	20
7	9	19	23
7	10	21	26
7	11	24	29

<sup>1</sup>See Appendix Table C-11 for sizes of drawers containing two and three sections of the sizes given.

<sup>2</sup>Allowance 45 cubic inches per pound, and 2-inch margin over contents.

A convenient drawer for cake storage is 13 inches wide and 6 inches high (inside). A drawer of this size is satisfactory also for bread except for situations where more than four loaves are stored. Data on the storage requirements of bread and cake are given in Appendix Table C-14.

### Other Unit Measures

Tables 13 to 17 give the information needed in planning storage facilities for articles not used in food preparation or service that may need to be stored in the kitchen.

Table 13 deals with the storage of cleaning equipment, table leaves, and ironing board. In groups 1 to 5 there are listed only the pieces of equipment used in cleaning the kitchen, and the accompanying series of cabinet dimensions is intended, therefore, for the situation in which storage is provided elsewhere for articles used in cleaning other parts of the house. Groups 6 to 9 include all articles commonly used in house cleaning except vacuum cleaners, and the dimensions applying to them are suitable for the situation in which



the kitchen cabinet or closet is the only place in the house planned for cleaning materials.

Table 13. MINIMUM INSIDE DIMENSIONS OF CABINET SPACE PLANNED FOR THE STORAGE OF CLEANING EQUIPMENT, TABLE LEAVES, AND IRONING BOARD.

Group	Articles stored	Minimum inside dimensions of cabinet <sup>1</sup>		
		Depth	Width	Height
		<i>Inches</i>	<i>Inches</i>	<i>Inches</i>
1.....	Broom only; or broom and dustpan	33	14	56
2.....	Broom, dustpan, wet mop, mop pail, ironing board, 5 table leaves	14	6	56
3.....	Omit ironing board from group 2	16	24	70
4.....	Omit table leaves from group 2	14	21	64
5.....	Omit ironing board and table leaves from group 2	16	18	70
6.....	Broom, dustpan, wet mop, mop pail, ironing board, 7 table leaves, dust mop, wall brush, carpet sweeper, waxer	14	15	64
7.....	Omit ironing board from group 6	16	37	70
8.....	Omit table leaves from group 6	23	26	70
9.....	Omit ironing board and table leaves from group 6	16	33	64
		23	22	64
		16	29	70
		16	25	64

<sup>1</sup>When two sets of measures are given, the first one applies to the situation in which the minimum front-to-back measure of the cabinet is determined by the requirement of some one article in the group of material stored. In that case the depth is the minimum possible, and the width is the amount required for the storage of the specified material when the cabinet is minimum depth. The second set of measures applies to the situation in which the minimum side-to-side measure is determined by the requirements of some one article. Where only one set of figures is given they apply to both situations.

Table 14 lists the laundry equipment likely to be used in the rural home where laundry work is done in the kitchen in cold weather, and gives the dimensions of closets or floor-to-ceiling cabinets that are adequate for this equipment when sides and back are utilized for articles that will hang. A cabinet about 3 by 5 feet is needed for this purpose.

In Appendix Table C-15 there are listed the unit dimensions of farm and home business materials that may be stored in the kitchen. To accommodate any of these materials, the lateral inside measures

Table 14. MINIMUM INSIDE DEPTH AND WIDTH OF A FLOOR-TO-CEILING CABINET PLANNED FOR THE STORAGE OF LAUNDRY EQUIPMENT.

Group	Articles stored	Minimum inside dimensions of cabinet <sup>1</sup>		Width of door opening
		Width	Depth	
		<i>Inches</i>	<i>Inches</i>	<i>Inches</i>
1.....	Washing machine, 2 tubs, folded tub stand, wash board, boiler with lid, clothes basket, folded drying rack, ironing board; shelving for supplies 8 inches wide, 33 inches long, 12 inches clearance	61	33	48
		58	36	48
2.....	Omit ironing board from group 1	58	33	48

<sup>1</sup>In the first set of measures the depth is determined by the requirement of the washing machine, and the width is that required when the material listed is stored in a cabinet of that depth.

of a straight-front cabinet with shelves or of a tier of drawers would need to be at least  $12\frac{1}{2}$  by 17 inches.

In view of the variations among farm families in the kinds and amounts of farm and home business materials stored in the kitchen, it is highly desirable for built-in storage provisions intended for them to be readily converted to other uses. Shelves should be removable and adjustable; drawers should be suitable for kitchen textiles, utensils, or food materials; dividers in sectioned drawers should be removable.

For sewing and mending, provision may need to be made in the kitchen for (1) hand work only, (2) machine and hand work, but with the main storage for supplies and equipment in another room, (3) the situation in which the kitchen sewing center is the main one for the house.

Suitable provision for the first situation would consist of a sectioned drawer 16 to 30 inches wide and 6 inches high, or two drawers 8 to 16 inches wide and 3 inches and 6 inches high, respectively (inside measure).

When all sewing is done in the kitchen, it is desirable to provide a work counter 36 inches high for cutting out small pieces, basting, and pinning. A good length for this counter is 60 inches. Ideally, the counter will be behind doors, so that work underway can be left undisturbed between sewing periods.

Appendix Table C-16 lists unit dimensions for the storage facilities suitable for treadle and portable electric machines, shelving and drawer space for minor sewing equipment and supplies, and hanging space for garments under construction.

In Appendix Table C-17 there are listed the unit measures needed in planning for the storage of outdoor clothing. Suitable kitchen provision for these articles is an open alcove or ventilated floor-to-ceiling cabinet 3 to 6 feet wide, 15 to 24 inches deep, and fitted with high and low garment hooks, shelving or trough for caps, and low shelf or platform for footwear.

Also included in this table are the unit measures for hooks intended for aprons and smocks in use. Two hooks set about 5 inches apart and 56 inches from the floor constitute minimum provision for these articles.

Some provision should be made in the kitchen for the play materials used there (as table games, paper dolls, and small toys), preferably a drawer used for no other purpose. The preferred location is near the place where the child plays. Suitable inside heights for this drawer range from 3 to 6 inches.

## SPACE FOR WORKER AND FOR OPERATION OF EQUIPMENT

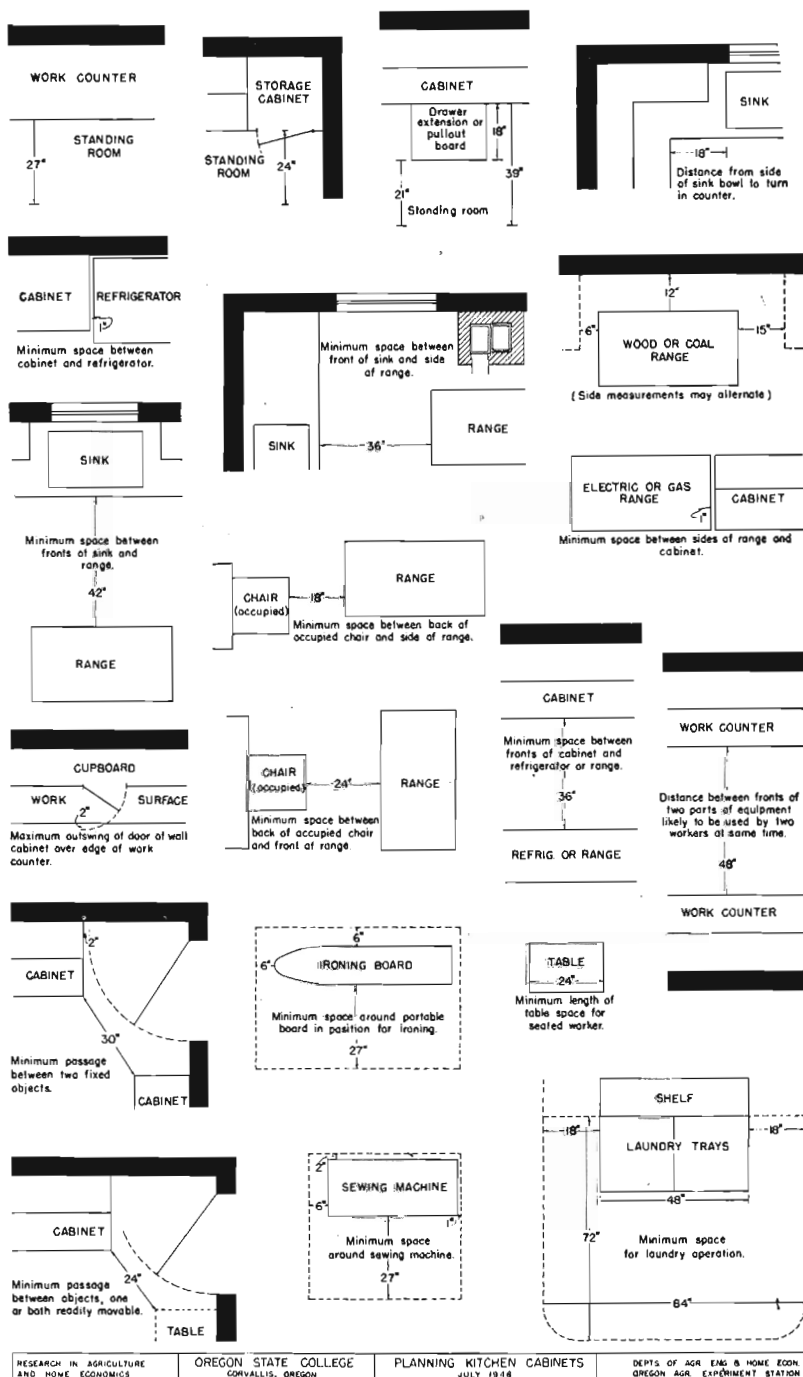
In a given situation the design of a kitchen cabinet may be influenced by the space needed around adjacent or opposite pieces of equipment such as refrigerator, range, or meal table, space for door swing, width of door or window casings, or space required for passage through the room. In Table 15 there are given recommended allowances for passages, door swing, and floor space around the main types of fixed equipment. These are illustrated by Figure 13.

Table 15. DIMENSION STANDARDS FOR KITCHEN FROM STANDPOINT OF WORKER'S REQUIREMENTS AND OPERATION OF EQUIPMENT.<sup>1</sup>

Item	Dimension
	<i>Inches</i>
<i>Minimum front-to-back measure of space for worker</i>	
Before work counter or pull-out board used in place .....	27
Before storage cabinet with shelves .....	24
Before drawer (drawer extension 18 inches; standing room 21 inches) .....	39
<i>Minimum side-to-side measure of space for worker</i>	
Space to stand (elbow height) .....	30
Distance from side of sink bowl to turn in counter .....	18
Table space for seated worker .....	24
<i>Minimum space between fixed equipment</i>	
Side of cabinet and side of wood or coal range .....	6 or 15 <sup>2</sup>
Side of cabinet and side of electric or gas range .....	1
Side of cabinet and side of refrigerator .....	1
Front of sink bowl and front of range .....	42
Front of sink bowl and side of range .....	36
Front of sink counter, draft cooler, or floor-to-ceiling cabinet, and front of range .....	36
Front of cabinet and front of refrigerator .....	36
Fronts of two parts of equipment likely to be used by two workers at same time .....	48
<i>Minimum clearance of door swing over width of door</i> .....	2
<i>Maximum outswing of door of wall cabinet over edge of work counter below</i> .....	2
<i>Front-to-back measure of space occupied by drawer or pull-out board when extended</i> .....	18
<i>Minimum width of major passage</i>	
Between fixed or hard-to-move objects .....	30
Between objects if one or both readily movable .....	24
<i>Minimum widths of other passages</i>	
Between object of less than elbow height (unless readily moved) and wall or high object .....	21
Between two objects of less than elbow height .....	18
<i>Minimum space around meal table</i>	
Between end of table and side of range, if table extended .....	18
Between end of table and side of range, if table not extended .....	24
Back of occupied chair and side of range .....	18
Back of occupied chair and front of range .....	24
<i>Minimum space for washing operation</i>	
Width .....	84
Depth .....	72
<i>Minimum space around sewing machine</i>	
Left end .....	6
Right end .....	1
Back .....	2
Front .....	27
<i>Minimum space around ironing board</i>	
Open end .....	6
Back .....	6
Front .....	27

<sup>1</sup>Oregon Experiment Station Bulletin 348, *Standards for Working Surface Heights*, and unpublished results of studies of space required for operation of equipment. See Appendix B for other standards for dimensions of space back of and at sides of fixed equipment.

<sup>2</sup>Fifteen inches at one side or the other is needed to give access to back of range for cleaning.



RESEARCH IN AGRICULTURE AND HOME ECONOMICS	OREGON STATE COLLEGE CORVALLIS, OREGON	PLANNING KITCHEN CABINETS JULY 1948	DEPTS. OF AGR. ENG. & HOME ECON. OREGON AGR. EXPERIMENT STATION
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Figure 13. Minimum dimensions of floor space in front and at sides of equipment.

# APPENDIX A. CABINET CONSTRUCTION

Table A-1. CONSTRUCTION ALLOWANCES FOR KITCHEN CABINETS.

Item	Allowance
<i>Thickness of materials:</i>	<i>Inches</i>
Frame:	
Side of floor-to-ceiling or wall cabinet	$\frac{3}{8}$
Side of base cabinet	$\frac{3}{8}$ or $\frac{3}{4}$
Facing of floor-to-ceiling or wall cabinet	to $1\frac{1}{8}$
Facing of base cabinet	
Back of hanging cabinet	
Back of cabinet with shelves or drawers	
Bottom of frame	
Support for drawer	
Support for cabinet (2 x 4 on edge)	$3\frac{1}{8}$
Doors, flush type: <sup>1</sup>	
Solid wood or panel	$\frac{1}{2}$
Plywood	$\frac{1}{2}$ or 1
Hollow or built up	1
Drawers:	
Side	$\frac{1}{4}$ to $\frac{3}{4}$
Back	$\frac{1}{4}$ to $\frac{3}{4}$
Front	to 1
Bottom	$\frac{1}{4}$ to $\frac{3}{4}$
Dividers; insets	to $\frac{1}{2}$
Shelves; splash back; pull-out boards	to $1\frac{1}{2}$
Counter top	1 to $1\frac{1}{2}$
Width of facing strip	$1\frac{1}{2}$
if adjacent to turn in counter	$2\frac{1}{4}$
<i>Actual widths of finished lumber used for shelves:</i>	
Six-inch board	$5\frac{1}{8}$
Eight-inch board	$7\frac{1}{8}$
Twelve-inch board	$11\frac{1}{4}$
<i>Clearances:</i>	
Drawer and drawer opening, —vertical; lateral	$\frac{1}{8}$
Pullout board and opening, —vertical; lateral	$\frac{1}{8}$
<i>Overall Dimensions:</i>	
Top of counter to top of highest drawer opening or door opening below it (counter, pull-out board plus clearance, and framing or construction)— $1\frac{1}{2}$ inches plus thickness of counter	$2\frac{1}{2}$ to $3\frac{1}{2}$
Floor of room to bottom of lowest opening above it (support $3\frac{1}{2}$ inches, plus thickness of base of cabinet, $\frac{3}{4}$ inch)	$4\frac{1}{2}$
<i>Difference between inside and overall dimensions:</i>	
Depth of cabinet—	
Equipped with shelves and hinged doors $\frac{3}{4}$ inch thick	1
Equipped with shelves and sliding doors $\frac{3}{4}$ inch thick	2
Equipped with hooks and hinged doors $\frac{3}{4}$ inch thick	$1\frac{1}{2}$
Equipped with hooks and sliding doors $\frac{3}{4}$ inch thick	$2\frac{1}{2}$
Height of drawer	1
Width of drawer	1 to $1\frac{1}{2}$
Depth of drawer	1 to $1\frac{1}{2}$
Minimum difference between overall depth of base cabinet and inside depth of drawer	2
Difference between width of drawer opening and inside width of drawer	$1\frac{1}{2}$ to $1\frac{3}{4}$
<i>Distance between drawer openings:</i>	
Vertical	$\frac{3}{4}$
Lateral	$1\frac{1}{2}$
<i>Overhang, front of work counter</i>	1
<i>Height of recess for toe space (formed by 2 x 4's set on edge)</i>	$3\frac{1}{8}$
<i>Maximum length of shelving between uprights</i>	60 to 72
For Douglas fir, 12 inches wide by $\frac{3}{4}$ inch thick, nailed at back:	
Maximum span for dish cabinet, 60 inches; packaged groceries	
66 inches; cooking utensils 72 inches.	

<sup>1</sup>Lip type is  $\frac{1}{4}$  inch thicker than the flush type.

Table A-2. STOCK ITEMS AVAILABLE IN OREGON.

## a. Cabinet doors

Type available	Thickness	Dimensions			
		Widths		Heights	
		Range	Interval	Range	Interval
	<i>Inches</i>	<i>Inches</i>	<i>Inches</i>	<i>Inches</i>	<i>Inches</i>
One-panel cupboard doors....	$\frac{3}{4}$	12 to 24	2	12 to 70	2
Semi-stock one panel plain or lipped cupboard doors..	$\frac{3}{4}$ , 1 $\frac{1}{16}$	18 to 30	6	18 to 72	6
Solid wood plain or lipped cupboard doors .....	$\frac{3}{4}$	12 to 26	2	18 to 72	6

Table A-2. STOCK ITEMS AVAILABLE IN OREGON

## b. Drawers

Type available	Dimensions (outside)				
	Width		Height		Depth
	Range	Interval	Range	Interval	
	<i>Inches</i>	<i>Inches</i>	<i>Inches</i>	<i>Inches</i>	<i>Inches</i>
Knock down drawers (stock) .....	10 to 20	2	3, 3 $\frac{1}{2}$ , 4 to 10	1	18
Knock down drawer (stock) .....	24 to 48	4	3, 3 $\frac{1}{2}$ , 4 to 10	1	18
Semi-stock drawers, set up .....	12 to 48	6	Order	....	20
Metal lined .....	12, 16	....	8, 11	....	18
Enameled food drawers					
One compartment .....	9 $\frac{1}{2}$ , 13 $\frac{1}{2}$ , 15 $\frac{1}{2}$	2	7 $\frac{1}{2}$	....	18
One compartment .....	15 $\frac{1}{2}$	....	10 $\frac{1}{2}$	....	18
Two compartment .....	15 $\frac{1}{2}$	....	7 $\frac{1}{2}$	....	18

Table A-2. STOCK ITEMS AVAILABLE IN OREGON  
c. Other cabinet details

Type	Dimensions (overall)		
	Side to side	Vertical	Front to back
	<i>Inches</i>	<i>Inches</i>	<i>Inches</i>
Metal drawer glides .....	....	....	17, 19, 21
Metal flour bin, for installation on underside of shelf .....	11	12	9½
Metal lid racks .....	11½, 13½	....	....
Metal louvers .....	8	5½	5½
For draft cooler .....	10½	3	....
For cabinet .....	....	....	....
Metal pull-out rack for utensils that can be hung .....	17	3½	18
Metal shelves with guards (for installation on doors) .....	14, 16, 18	3	4½, 5½
For packages .....	12, 18	2	2½
For spices .....	9½	3	3½
For sink doors .....	....	....	20½
Metal towel dryer, pull-out .....	11, 15	7½, 10½	16½
Tin drawer insets .....	....	....	....
Wire bins for draft cooler .....	12½	7	18
Single drawer unit .....	13	16½	18
Two drawer unit .....	13	24	18
Three drawer unit .....	....	....	....
Wire racks, for installation on underside of shelf .....	18	3½	3½
Narrow .....	12	4½	10
Wide .....	16, 18	....	11
Wire shelves, flat .....	14	....	14
....	16, 19	....	15
....	20	....	17
Wooden boards .....	20, 24	3	18
....	30	4	20
Wooden swinging bins .....	14	12, 14	14
....	16	12, 14	16
....	18	12	18
....	14	24, 26	14
....	16	24, 26	16
Wooden tilt bins .....	14, 16	24, 26	16

Table A-2. STOCK ITEMS AVAILABLE IN OREGON  
d. Room doors (selected)

Height	Width available
6'0" .....	2'0"; 2'4"
6'4" .....	2'0"; 2'4"; 2'6"
6'6" .....	1'6" to 2'8" in two-inch intervals
6'8" .....	1'4" to 2'8" in two-inch intervals

Table A-2. STOCK ITEMS AVAILABLE IN OREGON  
e. Windows (selected)

Description	Height	Sash widths
Double hung .....	2'10"	1'8" to 3'0", 2-inch intervals
	3'2"	1'8" to 3'0", 2-inch intervals
	3'6"	1'8" to 3'0", 2-inch intervals
	3'10"	1'8" to 3'0", 2-inch intervals
	4'2"	1'10" to 3'0", 2-inch intervals
Casement .....	4'6"	1'8" to 3'0", 2-inch intervals
	3'0"	1'6" to 2'0", 2-inch intervals
	3'4"	1'6" to 2'0", 2-inch intervals
	3'10"	1'6" to 2'0", 2-inch intervals
	4'0"	1'6" to 2'0", 2-inch intervals
....	4'6"	1'6" to 2'0", 2-inch intervals

## APPENDIX B. ROOM ALLOWANCES FOR PURCHASED EQUIPMENT

Table B-1. ROOM SPACE ALLOWANCES FOR MECHANICAL REFRIGERATORS

Approximate capacity <sup>1</sup>	Suggested space allowances <sup>2</sup>			
	Width of floor space		Wall to edge of opened door <sup>3</sup>	Distance, floor to cabinet above refrigerator <sup>4</sup>
	Free standing	Between fixed equipment		
<i>Cubic feet</i>	<i>Inches</i>	<i>Inches</i>	<i>Inches</i>	<i>Inches</i>
5 .....	30	32	54	61
6 .....	32	34	56	64
7 .....	34	36	58	67
8 .....	36	38	60	70

<sup>1</sup>Minimum recommended by the U. S. Department of Agriculture Bureau of Home Economics for rural homes; 2-3 persons, 5 cubic foot capacity; 4 to 5 persons, 6 cubic foot capacity; 6 to 8 persons, 8 cubic foot capacity. Table II, page 8, *Minimum Desirable Kitchen Working and Storage Space and Equipment*, Mimeograph 875, U. S. Department of Agriculture Bureau of Home Economics.

<sup>2</sup>Based on dimensions and recommended clearances of 1935-1946 models of 13 manufacturers. Consideration is given to the fact that air circulation about refrigerator increases its efficiency.

<sup>3</sup>Door open 90 degrees.

<sup>4</sup>Electric refrigerators.

Table B-2. ROOM ALLOWANCES FOR STOVES

Fuel and type of stove	Suggested room allowance				
	Width		Distance, front of stove to wall		Oven door drop <sup>3</sup>
	Stove itself	Total floor space if between fixed equipment <sup>1</sup>	Flammable <sup>2</sup>	Fireproof	
	<i>Inches</i>	<i>Inches</i>	<i>Inches</i>	<i>Inches</i>	<i>Inches</i>
Wood or coal, 6-hole <sup>4</sup>					
Without attached reservoir or plate .....	38	54 to 65	41	34	16
With attached reservoir or plate .....	47	63 to 74	41	34	16
Wood or coal, 2-hole .....	16	32 to 43	41	34	12
Electricity, 3 or 4 unit					
Flat top, no table space....	21	23	26	26	20
Flat top, with table space..	40	42	26	26	20
High oven .....	44	46	26	26	18 <sup>5</sup>
Electric plate attachment ....	10	....	....	....	....
Gas, 3 or 4 unit					
Flat top, no table space....	21	23	26 to 30	26 to 30	14
Flat top, with table space..	40	42 or 55 <sup>5</sup>	26 to 30	26 to 30	14
High oven .....	44	49 or 59 <sup>5</sup>	26 to 30	26 to 30	14
Gas plate attachment .....	13	....	....	....	....
Combination wood or coal, 2-hole and electricity or gas, 4 unit .....	38	54 to 65	41	34	18 <sup>6</sup>
Kerosene					
3-unit stove, 2-unit portable oven, tank at side .....	43	47	18	18	14
Flat top stove, oven and fuel tank enclosed .....	47	49	24	24	18
High oven, oven and fuel tank enclosed .....	47	51	24	24	18

<sup>1</sup>Suggested minimum clearance for wood or coal stoves: Clearance on side next to firebox varies from 1 to 12 inches, depending upon whether adjacent built-in or equipment should be kept away from heat, and upon the space needed for hand action in reaching the draft control. The space on the other end varies from 1 to 6 inches, depending upon stove construction. There should be at least 15 inches on one side or the other (preferably the firebox end) to provide access for cleaning. Total minimum clearance at sides of coal or wood stove therefore varies from 16 to 27 inches. Suggested clearance for electric range is 2 inches. Permits use of flat cleaning tool, and allows for manipulation in placing or removing range.

<sup>2</sup>Allowance back of smoke pipe is 9 inches. Corvallis (Oregon) Code, Section 41, 1938 edition.

<sup>3</sup>Extension from face of stove.

<sup>4</sup>May be 4-hole and plate, or 2-hole and plates.

<sup>5</sup>Second measure allows access for cleaning.

<sup>6</sup>Electric oven.



Table B-3. ROOM ALLOWANCES FOR SINKS (ENAMEL).

Designation and description	Basin approximately 14" long		Basin 18" to 22" long		Basin 26" to 28" long	
	Catalog size <sup>1</sup>	Room allowance <sup>2</sup>	Catalog size <sup>1</sup>	Room allowance <sup>2</sup>	Catalog size <sup>1</sup>	Room allowance <sup>2</sup>
	Inches	Inches	Inches	Inches	Inches	Inches
<i>One-basin sink not in cabinet:</i>						
1 Without back, drainboard, or provision for faucets; flat rim .....	16 x 20	14	24 x 20	22	30 x 20	28
2 Without back or drainboard. Faucets from ledge; flat rim..	.....	....	24 x 21	22	30 x 21	28
3 Without back; one drainboard; faucets from ledge; flat rim..	.....	....	42 x 21	22	.....	....
4 Without back; two drainboards; faucets from ledge; flat rim..	.....	....	54 x 21	21	.....	....
5 With high back; no drainboard; faucets through back; flat rim .....	.....	....	24 x 20	22	30 x 20	25
6 With high back; one drainboard; faucets through back; roll rim .....	.....	....	42 x 20	22	52 x 20	28
7 With high back; two drainboards; faucets through back; roll rim .....	.....	....	60 x 22	24	.....	....
8 With low back, one drainboard; roll rim..	.....	....	42 x 25	21	.....	....
9 With low back; two drainboards; roll rim .....	.....	....	60 x 25	22	.....	....

<sup>1</sup>That is, size of sink whose basin is nearest in size to that specified in column head.<sup>2</sup>Overall width of sink minus overlap of sink rim on work counter.

Table B-3. ROOM ALLOWANCES FOR SINKS (ENAMEL)—Continued

Designation and description	Basin approximately 13" long		Basin approximately 16" to 18" long	
	Catalog size <sup>1</sup>	Room allowance <sup>2</sup>	Catalog size <sup>1</sup>	Room allowance <sup>2</sup>
	Inches	Inches	Inches	Inches
<i>Two-basin sink not in cabinet:</i>				
10 Without back, drainboard, or provision for faucets; flat rim .....	32 x 20	30	42 x 20	40
11 Without back or drainboard; faucets from ledge; flat rim .....	32 x 21	30	42 x 21	40
12 With low back, no drainboard; flat or roll rim .....	.....	....	38 x 21	36
13 With low back; two drainboards .....	.....	....	72 x 25	34
<i>One-basin sink in cabinet:</i>				
14 Low back, one drainboard .....	.....	....	42 x 24	42
15 Low back, two drainboards .....	.....	....	54 x 24	54
<i>Two-basin sink in cabinet:</i>				
16 Low back, without drainboard .....	.....	....	42 x 25	42
17 Low back, two drainboards .....	.....	....	72 x 25	72

<sup>1</sup>That is, size of sink whose basin is nearest in size to that specified in column head.<sup>2</sup>Overall width of sink minus overlap of sink rim on work counter.

Table B-4. ROOM ALLOWANCES FOR TABLES.

Type	Desired table size		Comments	Representative commercial equipment <sup>1</sup>	
	Length	Width		Length	Width
	<i>Inches</i>	<i>Inches</i>		<i>Inches</i>	<i>Inches</i>
Meal table, seats 4	42 to 54	36 to 40	See Comment 1	48	36
Meal table, seats 6	66 to 78	36 to 40	See Comment 1	72	38
Meal bar, seats 4	54	16 to 20	See Comment 2	.....	.....
Utility table	24 to 48	22 to 30	See Comments 3, 5	40	26
Utility table, drop leaf					
Closed	16 to 27	20 to 27	See Comments 3, 4, 5	19	23
Open	36 to 44	20 to 27	See Comments 3, 4	41	23
Wheeled tray	24 to 30	18 to 24	See Comments 3, 5	28	18

**Comments:**

<sup>1</sup>Larger tables preferred for situation in which all meals are regularly eaten in kitchen and where group may include more than one man (as where hired help eats with family).

<sup>2</sup>Depth of meal bar may be 16 inches if adjacent to counter; 20 inches recommended if it is placed along wall.

<sup>3</sup>Size of utility table or wheeled tray depends on whether it supplements counter space or takes the place of it. Wider tables are recommended for center of floor.

<sup>4</sup>Room allowance depends on whether drop leaf table is used in place or not.

<sup>5</sup>Add 2 inches to length of table for room allowance when between two fixed objects.

Table B-5. ROOM ALLOWANCES FOR OTHER EQUIPMENT.

Item	Room allowance
Hot water tank:	
Electric (jacketed)	Approximately 40 gallons—23" diameter x 60" height.
Range boiler	40 gallons—14" diameter x 60" height (tank only); stand 10" high. Minimum distance to wall or equipment, 2".
Ironing board	Floor allowance, board open for use, 14" x 60". Free space at back, 6"; at end, 12".
Ironer in cabinet	35" x 17" x 36" height.
Towel racks:	
Bar	Total length 36" to 72". Minimum 18" for one bar.
Swinging	Overall length, folded, 24". Bar extension radius 18".
Roller	Length 21".
Built in between studding	12" x 36". Bar extension radius 30".
Stand	3-bar stand: overall length 22"; width 10" to 12", depending on diameter and slope of bars; minimum distance, lowest bar to floor, 27".
Seating facilities:	
Straight chair	Side-to-side allowance, 18", front-to-back allowance, 19"; height of back 36".
Stool (for use at sink)	14" diameter; 30" high.
Backless bench	Single, 14" x 18" x 17" height; double, 14" x 42".
Infant's high chair	19" x 20".
Wall telephone	Bell box, 7" x 9" x 4".
	Small wall phone, 9" high, 11" wide, 7" forward extension.
	Niche for wall phone, 12" high, 14" wide.
	Large wall phone, 20" high, 12" wide, 9" forward extension.
Telephone on shelf,	
With space for writing	For use while seated: shelf 16" wide, 28" long; top 28" from floor.
	For use while standing: shelf 16" wide, 18" long; top 42" from floor.
Without space for writing	Shelf 8" wide, 12" long.
Radio on shelf	Shelf length 20"; wall to front edge of shelf, 12"; height 12".
Wall clock	Width 8".
Mirror without frame	8" x 18".
Bulletin board; blackboard	21" x 30".
Heat register, cold air register	12" x 14".

## APPENDIX C. SUPPLEMENTARY UNIT MEASURES FOR STORAGE

Table C-1. UNIT MEASURES FOR SHELVING PLANNED FOR DISHES AND ARTICLES THAT MAY BE STORED WITH THEM.

a. Stacks of 6, 8, and 12

Item	Unit measures <sup>1</sup>				
	Minimum front to back <sup>2</sup>	Length <sup>3</sup>	Distance between shelves <sup>4</sup>		
			Number in stack	Full shelf over	Half shelf over
	<i>Inches</i>	<i>Inches</i>		<i>Inches</i>	<i>Inches</i>
Dinner plates .....	11	11	6	5	4
Diameter 9½ to 10½ inches			8	6	5
Dinner plates .....	10	10	12	7½	6½
Diameter 8½ to 9½ inches			6	4	3½
Dinner plates .....			8	5	4½
Diameter 7½ to 8½ inches			12	6½	6
Plates for soup service .....	9	9	6	4	3½
Diameter 7½ to 8½ inches			8	5	4½
Dinner plates .....			12	6	5½
Salad plates .....	8	8	6	4	3½
Diameter 6½ to 7½ inches			8	5	4½
Dinner plates .....			12	6	5½
Bread and butter plates ....	7	7	6	3½	3
Diameter 5½ to 6½ inches			8	4	3½
Dinner plates .....			12	5½	5
Saucers .....	7	7	6	4½	4
Diameter 5½ to 6½ inches			8	5	4½
Dinner plates .....			12	6	5½
Sauce dishes .....	6	6	6	5½	4½
Diameter 5 to 5½ inches			8	6	5
Dinner plates .....			12	6½	5½
Cereal dishes .....	7½	7½	6	6	5½
Diameter 5½ to 6½ inches			8	7	6½
Dinner plates .....			12	9	8½
Soup plates .....	8½	8½	6	6	5
Diameter 7½ to 8 inches			8	6½	6
Dinner plates .....			12	8	7½
Luncheon trays .....	13½	18½	6	3½	3
Length 15 to 18 inches			8	4	3½
Dinner plates .....			12	5	4½

<sup>1</sup>Dimension of article plus allowance for handling. See page 15.

<sup>2</sup>Minimum desirable depth of closed compartment or width of open shelving.

<sup>3</sup>Space allowance for utensil stored with longer dimension parallel to edge of shelf.

<sup>4</sup>For pottery saucers and sauce dishes, measures for distances between shelves should be increased as follows: Stack of 6, ¾ inch; stack of 8, 1 inch; stack of 12, 1½ inch.

Table C-1. UNIT MEASURES FOR SHELVEING PLANNED FOR DISHES AND ARTICLES THAT MAY BE STORED WITH THEM

b. Other dishes and trays

Item	Unit measure <sup>1</sup>		
	Minimum front to back <sup>2</sup>	Length <sup>3</sup>	Distance between shelves
	<i>Inches</i>	<i>Inches</i>	<i>Inches</i>
<i>Not stacked:</i>			
Cup .....	4½	5	3½
Cream soup bowl .....	5½	7	3
Bowl—diameter 4½ to 6½ inches .....	6½	6½	3
Gravy boat .....	7½	10½	7½
Salad bowl .....	10½	10½	5
Vegetable dish with cover .....	9½	11½	7
Vegetable dish, open, round—10½ x 10 inches .....	11	11½	4
Vegetable dish, open, oval—8½ x 10 inches .....	9½	11	3½
Platter, small—overall length 10½ to 12 inches .....	11½	13	2
Platter, medium—overall length, 12½ to 14½ inches .....	11½	13	2
Platter, large—overall length 15 to 18 inches .....	12½	18½	2
Platter, medium .....	6	8	6
Pitcher, large .....	8½	10	9½
Sugar and creamer set .....	4½	6½	5½
Relish dish, round .....	6	6	2
Relish dish, oval .....	6	9	2
Drinking glass, tumbler—height 3½ to 4 inches .....	3	3	5
Drinking glass, tall—height 4½ to 5½ inches .....	2½	2½	6
Drinking glass, footed—height 5½ to 6½ inches .....	3½	3½	8
Drinking glass, stemmed—height 6½ to 7½ inches .....	3½	3½	9
Sherbet, footed—height 3½ to 4½ inches .....	4	4	5
Sherbet, stemmed—height 5 to 5½ inches .....	3½	3½	6½
Serving tray, rectangular .....	9½	13	2
Serving tray, round .....	13½	13½	2
Luncheon tray, rectangular .....	13½	18½	2
<i>Stacked:</i>			
Cups, stack of 2 .....	4½	5	6
Cream soups, stack of 2 .....	5½	7	5½
Bowls, stack of 2 .....	7	6½	7
Vegetable dishes—stack of 2, round .....	11½	11	7
Vegetable dishes—stack of 2, oval .....	9½	11	6
Platters, stack of 2 .....	11½	13	3
Platters, stack of 2 .....	11½	15	3
Platters, stack of 2 .....	12½	13½	3
1 platter stacked with 1 vegetable dish .....	11½	15	4
2 platters stacked with 1 vegetable dish .....	11½	15	4½
1 platter stacked with 2 vegetable dishes .....	11½	15	4½
2 platters stacked with 2 vegetable dishes .....	11½	15	5
Relish dishes—stack of 2, round .....	6	6	3½
Relish dishes—stack of 2, oval .....	6	9	3½

<sup>1</sup>See Appendix Table C-1a, footnote 1.

<sup>2</sup>See Appendix Table C-1a, footnote 2.

<sup>3</sup>See Appendix Table C-1a, footnote 3.

Table C-1. UNIT MEASURES FOR SHELVEING PLANNED FOR DISHES AND ARTICLES THAT MAY BE STORED WITH THEM

c. Flower containers

Description <sup>1</sup>	Unit measure <sup>2</sup>		
	Minimum front to back <sup>3</sup>	Length	Distance between shelves
	<i>Inches</i>	<i>Inches</i>	<i>Inches</i>
Small diameter, low .....	4	4	4
Medium height .....	4	4	7
Tall .....	3	3	9
Medium diameter, low .....	8½	8½	5
Medium height .....	8	8	8
Tall .....	7	7	11
Large diameter, low .....	12½	12½	6
Medium height .....	12½	12½	9
Tall .....	9	9	15

<sup>1</sup>The containers were classified with respect to the type of flower arrangement for which they are suitable. Examples of items 1, 3, 4, and 7:

1. A small, low arrangement, as of violets.

3. Bud vase.

4. Centerpiece, small meal table.

7. Centerpiece, larger meal table.

<sup>2</sup>See Appendix Table C-1a, footnote 1.

<sup>3</sup>See Appendix Table C-1a, footnote 2.

Table C-2. UNIT MEASURES FOR SHELVING PLANNED FOR UTENSILS AND ARTICLES THAT MAY BE STORED WITH THEM.

Article		Unit measure <sup>1</sup>		
Group <sup>2</sup>	Description	Minimum front to back <sup>3</sup>	Length <sup>4</sup>	Distance between shelves <sup>5</sup>
		<i>Inches</i>	<i>Inches</i>	<i>Inches</i>
Sink center.....	Kettle, 8-quart, lid clamps on	10½	10½	10
	Kettle, 6-quart, steamer inset	10½	12½	10, 8 <sup>a</sup>
	Kettle, 4-quart, lid perforated for draining	10	11½	8½
	Double boiler, upper shallow, 2½-quart, lower 3-quart	15	8½	10½, 8
	Double boiler, upper deep, 1½-quart, lower 2-quart	12	7	11, 9
	Saucepan to fit top of teakettle	9	6½	4½
	Pressure cooker, 4-quart	16	10	10½, 9
	One-quart measure	4½	4½	8½
	2-cup measure	4½	4½	4½
	Glass reamer	7	7	5
	Dish pans	13	18½	9
	Drain rack	16	20	7
	Strainer	9½	9½	5
	Wire sieve on stand	9½	12½	7½
	Pail, 3-gallon	12	12½	13
	Pan for use in preparing vegetables	13	13	4
	Hand churn, 1-gallon	9	9½	17
Stove center .....	Double skillet, lower part	17	13	6
	Double skillet, upper part	17	13	5
	Frying pan	20	13½	5
	Frying pan	16½	9½	5
	Griddle	16	13	4
	Roasting pan	11	15	4
	Trivet	9	16	4½
	Cooling rack	11	15	2½
	Teapot, 1-quart	7	7	8½
	Coffee maker, 1-quart	7½	7	13
	Salt shaker, 2-cup	4	4	6
	Flour dredger, 2-cup	4	4	6
	Flat lids, assorted	14	14	3½
Mixing center .....	Casserole, 2-quart oval	8½	12½	8½, 6
	Pudding pan	11	11	4½
	Muffin pans, 8 cup (½ c. size)	8	14½	3½
	Cake pan with tube	11½	11½	7½
	Loaf cake pan	10	10	4
	Layer cake pans	10	10	4
	Bread pans	6½	10½	5½
	Cookie sheets	13	16½	2½
	Pie pans	10½	10½	3½
	Bowl, 6-quart	13½	13½	8½
	Bowl, 4-quart	11½	11½	7½
	Bowl, 2-quart	9	9	7
	Bowl, 1-quart	7	7	6
	Measure, 1-cup	4	4	5½
	Set of measures, nested	4	4	4½
	Meat grinder	10½	12	6
	Grater	5½	5½	12½
	Sifter, 1-quart	7	6	8½
	Mixer frame	14	10	17
	Mixer bowl, large	10	10	7
	Mixer bowl, small	7½	7½	6
	Mixer, juice bowl	8	8	7
	Mixer, juice sieve	5	5	4
	Mixer, beaters	8	4	4
	Mixer, juicer	5½	3	4½
	Freezer, 2-quart, tub	14	9	13
	Freezer, 4-quart, inset	7	6½	14½
	Lunch box	6	11	11

Table C-2. UNIT MEASURES FOR SHELVING PLANNED FOR UTENSILS AND ARTICLES THAT MAY BE STORED WITH THEM—Continued.

Article		Unit measure <sup>1</sup>		
Group <sup>2</sup>	Description	Minimum front to back <sup>3</sup>	Length <sup>4</sup>	Distance between shelves <sup>5</sup>
		<i>Inches</i>	<i>Inches</i>	<i>Inches</i>
Serving center .....	Toaster	7	11½	9
	Waffle iron	11	11½	9
Unassigned Canning Equip- ment	Kettle, 3-gallon	14	14	10
	Pressure canner, 7-quart or 14-pint	17	17½	23, 18
	Funnel, large mouth	5½	5½	4½
	Funnel, small mouth	4½	4½	5½
	Pot with spout (paraffin)	7	8	11
	Colander	12	12	7
	Copper	7	5	17
	Sealer (in box)	10½	17	11
	Milk pail, 3-gallon	13	13½	16
	Milk pans	14	14½	4
Dairy Products Equipment	Cream can, 3-gallon	10½	10½	16
	Milk strainer	12	12	9
	Butter bowl and paddle	16	15	5
	Butter mold	6½	4	3
	Bean pot, 3-quart	10	10	8½
Other Items	Coffee maker, 6-quart	10	10	12½
	Bread raiser, 2½-gallon	17	17½	11½, 9
	Platform scales	9	9	12
	Old newspapers, folded twice	9½	13	4
	Iron with cord and stand	10	6	9
	Baby feeding sterilizer, 7-bottle	11	11½	12½
	3 electric cords, detached, coiled in box	9	6	4
	Corn popper	10	15	10

<sup>1</sup>Dimensions of utensil plus allowance for handling. See page 15.

<sup>2</sup>Place in or near which it is desirable to store specified article.

<sup>3</sup>Minimum desirable depth of closed compartment or width of open shelving.

<sup>4</sup>Space allowance for utensil stored with longer dimension parallel to edge of shelf.

<sup>5</sup>Clearance sufficient for storage on lowest shelf in base cabinet. Assumed parts assembled (except double skillet), i.e., lids on kettles, upper part of double boiler nested in lower, etc.

<sup>6</sup>Where two measures are given, the first one is for the utensil with lid placed as for use, the second, with lid inverted.

Table C-3. UNIT MEASURES FOR SHELVING INTENDED FOR PACKAGED FOODS, CLEANING SUPPLIES, AND RECIPES.

Group <sup>1</sup>	Packages stored		Unit measure <sup>2</sup>		
	Contents	Capacity	Minimum front to back <sup>3</sup>	Length <sup>4</sup>	Distance between shelves <sup>5</sup>
			<i>Inches</i>	<i>Inches</i>	<i>Inches</i>
Draft cooler .....	Butter	1 lb.	7 <sup>1</sup> / <sub>2</sub>	2 <sup>1</sup> / <sub>2</sub>	3
	Canned fish	1 lb.	7 <sup>1</sup> / <sub>2</sub>	5	3 <sup>1</sup> / <sub>2</sub>
	Canned fruit	1 lb. 14 oz.	4 <sup>1</sup> / <sub>2</sub>	4	6
	Canned meat	12 oz.	5 <sup>1</sup> / <sub>2</sub>	3	5
	Canned vegetables	1 lb. 12 oz.	4 <sup>1</sup> / <sub>2</sub>	3	5
	Chocolate—cake	10 oz.	8 <sup>1</sup> / <sub>2</sub>	4	2
	Cocoa—tin	1 lb.	5	3	7 <sup>1</sup> / <sub>2</sub>
	Cocunut	1 lb.	8 <sup>1</sup> / <sub>2</sub>	2 <sup>1</sup> / <sub>2</sub>	8 <sup>1</sup> / <sub>2</sub>
	Cooking fats	8 lb.	8 <sup>1</sup> / <sub>2</sub>	6	10
	Molasses, sirup	6 lb.	7	4	9 <sup>1</sup> / <sub>2</sub>
	Pectin	12 oz.	4	2 <sup>1</sup> / <sub>2</sub>	10 <sup>1</sup> / <sub>2</sub>
	Relishes, sauces	14 oz.	3 <sup>1</sup> / <sub>2</sub>	2 <sup>1</sup> / <sub>2</sub>	10 <sup>1</sup> / <sub>2</sub>
	Salad dressing, sandwich spread	2 lb.	4	3	8 <sup>1</sup> / <sub>2</sub>
	Salad oil	2 qt.	5 <sup>1</sup> / <sub>2</sub>	2 <sup>1</sup> / <sub>2</sub>	10
	Vinegar	1 qt.	7 <sup>1</sup> / <sub>2</sub>	4	11 <sup>1</sup> / <sub>2</sub>
Mixing center .....	Baking powder	2 lb. 8 oz.	5	3 <sup>1</sup> / <sub>2</sub>	7 <sup>1</sup> / <sub>2</sub>
	Cornstarch	1 lb.	4	3	7 <sup>1</sup> / <sub>2</sub>
	Dessert powders, gelatin	5 oz.	6 <sup>1</sup> / <sub>2</sub>	2	4
	Flavorings, colorings	12 oz.	3 <sup>1</sup> / <sub>2</sub>	2	9 <sup>1</sup> / <sub>2</sub>
	Cake flour	2 lb. 12 oz.	7	2 <sup>1</sup> / <sub>2</sub>	9
	Paper napkins	80	7 <sup>1</sup> / <sub>2</sub>	7	4 <sup>1</sup> / <sub>2</sub>
	Salt	3 lb.	5 <sup>1</sup> / <sub>2</sub>	4	9 <sup>1</sup> / <sub>2</sub>
	Soda	1 lb.	4 <sup>1</sup> / <sub>2</sub>	2	5 <sup>1</sup> / <sub>2</sub>
	Spices	4 oz.	3	2	5
	Spices	8 oz.	3	2	6
	Spices	1 lb.	5	2 <sup>1</sup> / <sub>2</sub>	7 <sup>1</sup> / <sub>2</sub>
	Sugar	2 lb.	5 <sup>1</sup> / <sub>2</sub>	2	9
	Cookbook 6 <sup>1</sup> / <sub>2</sub> " x 11" x 9"	.....	7	1 <sup>1</sup> / <sub>2</sub>	10
	Recipe file 5" x 6 <sup>1</sup> / <sub>2</sub> " x 5" height, closed, 10" open	.....	5 <sup>1</sup> / <sub>2</sub>	7 <sup>1</sup> / <sub>2</sub>	10 <sup>1</sup> / <sub>2</sub>
	Box of bulletins, pamphlets	6	6 <sup>1</sup> / <sub>2</sub>	2	10
Sink center; foods .....	Dried currants, dates, raisins	15 oz.	4 <sup>1</sup> / <sub>2</sub>	3	6 <sup>1</sup> / <sub>2</sub>
	Barley, rice, tapioca	3 lb.	4 <sup>1</sup> / <sub>2</sub>	2 <sup>1</sup> / <sub>2</sub>	8
Sink center; cleaning supplies .....	Drain cleaners	1 lb. 6 oz.	3 <sup>1</sup> / <sub>2</sub>	3	5 <sup>1</sup> / <sub>2</sub>
	Lime; lye	13 oz.	3 <sup>1</sup> / <sub>2</sub>	3	5 <sup>1</sup> / <sub>2</sub>
	Scouring powders	1 lb. 3 oz.	4 <sup>1</sup> / <sub>2</sub>	3	8
	Soap flakes, powdered	3 lb.	3 <sup>1</sup> / <sub>2</sub>	8	11
	Water softeners	5 lb.	4 <sup>1</sup> / <sub>2</sub>	5 <sup>1</sup> / <sub>2</sub>	9 <sup>1</sup> / <sub>2</sub>
Serving center ....	Catsup, Worcestershire, etc.	14 oz.	3	2 <sup>1</sup> / <sub>2</sub>	10
	Cereals, ready to eat	1 lb. 12 oz.	9	3	10 <sup>1</sup> / <sub>2</sub>
	Crackers, cookies	2 lb.	10	10	8 <sup>1</sup> / <sub>2</sub>
	Loaf sugar	2 lb.	8	3 <sup>1</sup> / <sub>2</sub>	3 <sup>1</sup> / <sub>2</sub>
	Honey (pail)	5 lb.	6	5 <sup>1</sup> / <sub>2</sub>	6
Stove center .....	Cereals	3 lb. 12 oz.	7 <sup>1</sup> / <sub>2</sub>	5	11
	Coffee	2 lb.	7	4 <sup>1</sup> / <sub>2</sub>	7 <sup>1</sup> / <sub>2</sub>
	Macaroni, spaghetti	2 lb.	6 <sup>1</sup> / <sub>2</sub>	8	5
	Tapioca, rice	1 lb.	4	2	6 <sup>1</sup> / <sub>2</sub>
	Tea	1 lb.	6 <sup>1</sup> / <sub>2</sub>	4	10
	Matches (carton)	1 lb. 8 oz.	5 <sup>1</sup> / <sub>2</sub>	11	4

<sup>1</sup>Specified in terms of part of kitchen ensemble in or near which it is desirable to store the items specified.

<sup>2</sup>Articles stored with greatest dimension placed vertically and with least dimension parallel to edge of shelf, unless another placing was more desirable for convenience or space economy; measures allow for variations in sizes of packages of specified capacity.

<sup>3</sup>Minimum front-to-back measure of closed compartment, or width of open shelving.

<sup>4</sup>Average of common side-to-side measures, estimated from tally of all containers up to and including those with weight of contents specified as maximum.

<sup>5</sup>Increase these measures if articles are assigned to the lower part of a base cabinet. See page 16.

Table C-4. UNIT MEASURES FOR SHELVING PLANNED FOR CONTAINERS.

Container and capacity <sup>1</sup>	Unit measure <sup>2</sup>		
	Minimum <sup>3</sup>	Length	Distance between shelves <sup>4</sup>
	<i>Inches</i>	<i>Inches</i>	<i>Inches</i>
<i>Glass jars</i>			
Pint .....	4½	5	6½
Quart .....	4½	5	8
2-quart .....	5	5½	9½
<i>Bottles</i>			
Pint milk bottles .....	3½	4	8
Quart milk bottles .....	4½	4½	10½
Pint bottle, narrow neck .....	3	3	10½
Quart bottle, narrow neck .....	4	4½	10
2-quart bottle, narrow neck .....	5	5½	11½
4-quart bottle, narrow neck .....	7	7	13
<i>Canisters</i>			
1-quart .....	5	5	7
2-quart .....	6	6	7
3-quart .....	6½	7	8
4-quart .....	8	8½	8
<i>Covered dishes</i>			
1-pint pitcher .....	6	3½	6
1-pint .....	7	3½	7½
1-quart .....	8	3½	9
For 1 pound butter .....	8	5	3½
1-pint, round .....	5½	5½	4½
<i>Pails, cans</i>			
*½-gallon (3-pound vegetable shortening) .....	6½	6½	7
1-gallon .....	8½	8	8½
*5-quart (8 pound lard) .....	8½	8	9
2-gallon .....	9½	9	11½
3-gallon .....	12½	12	11½
*4-gallon (25-pound cocoanut) .....	11	11	15
*7½-gallon (48-pound lard) .....	16	16½	18
<i>Other</i>			
Cookie jar .....	9½	10	11
Bread and cake cabinet .....	12½	14	12
Cake plate with metal cover .....	14½	15	7

<sup>1</sup>Starred items are containers in which the food specified was marketed.<sup>2</sup>Container plus allowance for handling.<sup>3</sup>Minimum front-to-back measure of closed compartment or open shelving.<sup>4</sup>These measures should be increased for shelves in a base cabinet. See page 16.



Table C-5. UNIT MEASURES FOR THE STORAGE OF HANGING UTENSILS.

Group <sup>1</sup>	Utensil description	Unit measure <sup>2</sup>		
		Vertical <sup>3</sup>	Horizontal <sup>4</sup>	Extension from wall <sup>5</sup>
		<i>Inches</i>	<i>Inches</i>	<i>Inches</i>
Sink center .....	Kettle, 6-quart	13½	10½	10
	Kettle, 4-quart	12½	12	8
	Double boiler upper, shallow, 2½-quart	10½	8½	5½
	Double boiler bottom, 3-quart	15½	8½	7
	Double boiler upper, deep, 1½-quart	13½	7	7½
	Double boiler bottom, 2-quart	13½	7	7½
	Saucepan, small	10½	6½	4½
	Pressure cooker	17½	10	8
	Pressure cooker lid	17½	10	4
	Measure, 1-quart	8½	9	6½
	Measure, 2-cup	6½	6	6
	Funnel, large	6½	5	6
	Dishpan, larger	19½	13	8
	Dishpan, smaller	19	12	7
	Drain rack	20½	16	6½
	Wire sieve on stand	10	9½	7½
	Steel	17½	2½	3½
	Cup strainer	10	4	4
	Scissors	9½	5½	2½
	Dipper	6½	2½	3½
Stove center .....	Double skillet, lower	18½	13	5
	Double skillet, upper	18½	13	4
	Frying pan, 12-inch	21	13½	5
	Frying pan, 8-inch	17½	9½	5
	Griddle	17	13	3½
	Roasting pan	15½	11	4
	Trivet	16½	9	4½
	Cooling rack	15½	11	2½
	Ladle	15½	5	5
	Masher	11½	5	6
	Metal spoon	12½	3	3½
	Kettle lifter	9½	3	5
	Fork	15½	2	3
	Perforated stirring tool	13	4	2½
Mixing center .....	Muffin pans	15½	8	3½
	Cookie sheets	17	13	3
	Set of measures:			
	1-cup	5½	4½	4½
	½-cup	5½	4	3½
	¼-cup	5	4	3
	⅓-cup	5	3½	3
	Grater	10½	5	5½
	Cup strainer	10	4	4
	Pastry blender	6	7	3½
	Wire whisk	12	4½	4
Serving center ....	Rotary egg beater	13½	7	6
	Set of measuring spoons	6½	2½	3
	Ladle	15½	5	5
Unassigned .....	Dipper	6½	2½	3½
	Corn popper	30	6	3
Unassigned .....	Wood rack for wash boiler	23½	12	3
	Meat saw	28½	9	3
	Electric cords <sup>6</sup>	36	6	3
	Dish towels hung to dry <sup>7</sup>	20	20	2½

<sup>1</sup>Grouped according to kitchen center in or near which it is desirable to store the article specified.

<sup>2</sup>Dimension of article plus allowance for handling.

<sup>3</sup>Overall length from tip of handle, plus 1½ inches.

<sup>4</sup>Minimum width of wall on which hook is centered.

<sup>5</sup>Overall extension of hung utensil from wall, plus 2 inches.

<sup>6</sup>Hung over curved support.

<sup>7</sup>Hung over rods. Last measure is also distance between rods.

Table C-6. UNIT MEASURES FOR SLOT SECTIONS INTENDED FOR SHALLOW DISHES AND UTENSILS.

Center and article	Unit measure <sup>1</sup>									
	Horizontal slots					Vertical slots between shelves <sup>2</sup>				
	Depth minimum <sup>3</sup>		Width minimum <sup>4</sup>		(5) Distance between dividers	Depth minimum <sup>5</sup>		Height minimum <sup>6</sup>		(10) Distance between dividers
	(1) Depth	(2) Width	(3) Depth	(4) Width		(6) Depth	(7) Height	(8) Depth	(9) Height	
	Inches	Inches	Inches	Inches	Inches	Inches	Inches	Inches	Inches	Inches
<i>Stove center</i>										
Frying pan .....	....	....	20	14½	5	....	....	20	14	4
Frying pan .....	....	....	16½	11	5	....	....	16½	10½	4
Griddle .....	....	....	16	14	4	....	....	16	13½	3
Roasting pan .....	11	16	15	12	4	11	15½	15	11½	3
Trivet .....	9	17	16	10	4½	9	16½	16	9½	3
Cooling rack .....	11	16	15	12	2½	11	16	15	12	2
Flat lids .....	14	15	14	15	3½	14	14½	14	14½	4
<i>Mixing center</i>										
Pudding pan .....	11	12	11	12	4½	11	11½	11	11½	4
Muffin pans .....	8	15½	14½	9	3½	8	17	14½	9	2½
Loaf cake pans .....	10	11	10	11	4	10	10½	10	10½	3½
Layer cake pans .....	10	11	10	11	3½	10	10½	10	10½	3
Cookie sheets .....	13	17½	16½	14	2½	13	17½	16½	14	2
Pie pans .....	10½	11½	10½	11½	3½	10½	11	10½	11	2½
<i>Serving center</i>										
Vegetable dish, round .....	11	12	11	12	4	11	11½	11	11½	4
Vegetable dish, oval .....	9½	12	11	10½	3½	9½	11½	11	10	3½
Platter .....	11½	14	13	12½	2	11½	13½	13	12	2
Platter .....	11½	16	15	12½	2	11½	15½	15	12	2
Platter .....	12½	19½	18½	13½	2	12½	19	18½	13	2
Serving trays, rectangular .....	9½	14	13	10½	2	9½	13½	13	10	2
Serving trays, round .....	13½	14½	13½	14½	2	13½	14	13½	14	2
Luncheon tray, rectangular .....	13½	19½	18½	14½	2	13½	20	18½	14	2

<sup>1</sup>Dimension of article plus allowance for handling.<sup>2</sup>For inside height of drawer equipped with vertical slots, use front-to-back measure in column 6.<sup>3</sup>Article stored with longer dimension parallel to edge of shelf.<sup>4</sup>Article stored with shorter dimension parallel to edge of shelf.<sup>5</sup>Article stored on end.<sup>6</sup>Article stored on side.

Table C-7. SMALL UTENSILS USED AS BASIS FOR DIMENSIONS OF DRAWERS AND TRAYS LISTED IN TABLE 7 OF TEXT.<sup>4</sup> (Page 50).

Where used <sup>2</sup>	Description	Unit to which assigned <sup>3</sup>							
		Series A				Series B			
		Plan 1	Plan 2	Plan 3	Plan 4	Plan 1	Plan 2	Plan 3	Plan 4
Sink center .....	Measure, 2-cup, metal	a	c	b	b				
	Steel	a	a	c	c				
	Can opener	a	a	a	a				
	Can and bottle opener	a	a	a	a	a	a	a	a
	Scissors	a	a	a	a				
	*Funnel for bottles	a	c	b	a	a	a	c	b
	*Rubber plate scraper	a	c	b	b	a	a	a	a
Stove center .....	Turner	b	b	c	c	b	b	b	b
	Wooden spoon	b	b	c	c	b	b	b	b
	Metal perforated spoon	b	a	c	c	b	b	b	b
	Large bowl spoon, not perforated	b	a	c	c				
	Fork	b	b	c	c	b	b	b	a
	Fork	b	b	c	c				
	Tea ball	b	b	b	a	b	b	b	a
	Round chopper	b	b	b	a	b	b	b	a
	Masher	b	b	c	c				
	*Kettle lifter	b	b	b	a				
	*Pot holders	b	b	b	b	b	b	c	b
	*Stirring tool, perforated	b	a	c	c				
Mixing center .....	Wooden spoon	c	b	d	b	c	c	b	b
	Set of measuring spoons	c	c	d	b				
	Measure, 1-cup, glass	c	c	d	b	c	c	c	c
	Set of 4 measuring cups	c	c	d	b				
	Grater	c	b	d	c				
	Nut cracker	c	a	d	b	c	c	c	b
	Blender	c	c	d	b				
	Rotary egg beater	c	c	c	b				
	Rolling pin	c	c	d	c	c	c	b	b
	Cutter, small	c	c	d	b	c	c	c	b
	Cutter, large	c	c	d	b	c	c	c	b
	Double cutter	c	c	d	a	c	c	c	c
	Rubber bowl scraper	c	b	d	b	c	c	b	b
	*Egg whisk	c	b	d	b				
Serving center .....	Bread knife, 8-inch blade	a	a	a	a	a	a	a	a
Sink and stove centers .....	Slicing knife, 4-inch blade	a	a	a	a	a	a	a	a
Sink and mixing centers .....	Paring knife, 2½-inch blade	a	a	a	a	a	a	a	a
	Butcher knife, 7-inch blade	a	a	a	a	a	a	a	a
	*Cup strainer	a	c	b	b				
Sink and serving centers .....	*Small dipper	a	a	a	a	a	a	b	b
Stove and mixing centers .....	Case forks	b	b	b	a	b	b	b	a
	Spatula, 7-inch blade	b	a	a	a	b	b	b	a
Stove and serving centers .....	Ladle	b	b	c	c				
Mixing and serving centers .....	Spatula, 4-inch blade	c	a	a	a	c	c	b	a
All centers .....	Tablespoons	a	a	a	a	a	a	a	a
	Teaspoons	a	a	a	a	a	a	a	a

<sup>1</sup>Utensils listed are those (for which drawer storage is suitable) that are recommended in Oregon Experiment Station Bulletin 134. *A Set of Utensils for the Farm Kitchen*, except starred items. The latter have been recommended as additions to the standard utensil set by women who have used it. Pot holders are included because it is convenient to store them with utensils.

Many of the utensils are used in more than one place. The list does not include duplicates, however, except where more than one of a kind (as tablespoons) would be in use at the same time. It will be noted that the list includes only one article used in serving cold foods (a bread knife) that is not also needed elsewhere.

<sup>2</sup>Part of kitchen where frequently used: A utensil used at more than one work center is assigned to the drawer near the first-named center. For example, the slicing knife is assigned to the drawer near the sink. Duplicates (as tablespoons) are stored together.

<sup>3</sup>Small letters indicate the places to which each of the utensils was assigned in the various plans listed in Table 7 on page 50.

Table C-8. DIMENSIONS OF SECTIONS IN DRAWERS AND TRAYS FOR TABLE SILVER.

Items	Minimum capacity of section	Dimensions	
		Width	Length
	<i>Number</i>	<i>Inches</i>	<i>Inches</i>
Knives .....	12	4	11
Forks .....	12	3	8½
Teaspoons .....	12	3	6½
Tablespoons .....	12	3	9
Salad forks .....	12	3	7½
Dessert spoons .....	12	3	8
Butter spreaders .....	12	3	7
Bouillon spoons .....	12	3	6
Single pieces, small <sup>1</sup> .....	3 to 6	3	10
Single pieces, large <sup>1</sup> .....	3 to 6	4	13

<sup>1</sup>Single pieces include butter knife, pickle fork, cream ladle, sugar spoon, jelly spoon, sugar tongs, meat fork, berry spoon, gravy ladle, and servers.

Table C-9. UNIT DIMENSIONS FOR DRAWERS AND TRAYS ASSIGNED TO KITCHEN TEXTILES AND MISCELLANEOUS ARTICLES.

Material stored	Inside dimensions of drawer space, needed for unit			Allocation to center
	Width	Depth	Height <sup>1</sup>	
	<i>Inches</i>	<i>Inches</i>	<i>Inches</i>	
6 dish towels .....	10	10	4	Sink
6 dish cloths .....	4	8	4	Sink
6 hand towels .....	8	10	3	Sink
6 roller towels .....	8	10	4	Sink
3 tablecloths .....	12	20	3	Serving
6 cloth napkins .....	6	6	3	Serving
1 silence cloth .....	10	20	3	Serving
1 roll waxed paper .....	3	13	3	Mixing
8 bulletins, pamphlets .....	7	10	3	Mixing or planning
50 paper napkins .....	8	8	4	Mixing, serving
3 electric cords .....	4	8	3	Mixing, serving
6 fabric covers for containers..	4	8	3	Near refrigerator
6 rags .....	4	8	4	Unassigned
6 aprons .....	10	10	4	Unassigned
1 each—hammer, screw driver, and pliers .....	6	14	2	Unassigned

<sup>1</sup>For pile of 2 units of textiles, subtract one inch from twice the height.

Table C-10. STORAGE REQUIREMENTS OF CEREALS, SUGAR, DRIED FRUITS, AND VEGETABLES.

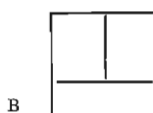
Commodity	Volume of specified weight				Desirable margin above contents <sup>1</sup>
	1 pound	5 pounds	10 pounds	25 pounds	
	<i>Cubic inches</i>	<i>Cubic inches</i>	<i>Cubic inches</i>	<i>Cubic inches</i>	<i>Inches</i>
Salt .....	23	114	227	570	1
Granulated sugar .....	33	164	328	820	1½
Farina .....	33	165	330	825	1½
Rice .....	33	165	330	.....	1
Navy or red beans .....	33	167	334	835	1
Cracked hominy .....	36	180	360	900	1
Cracked wheat .....	36	180	360	900	1½
Lima beans .....	36	182	364	.....	1
Prunes, 40-50's .....	37	189	368	945	2
Hominy grits .....	43	213	425	1,065	1
Cornmeal .....	43	216	431	1,078	1½
Seedless raisins .....	44	220	440	1,100	1
Brown sugar .....	46	229	459	1,147	1½
White flour .....	49	243	485	1,212	2 or 6
Whole wheat flour .....	55	273	546	1,365	2 or 6
Pearl barley .....	59	295	590	.....	1
Minute tapioca .....	66	330	660	.....	1
Filberts .....	76	380	760	1,900	1½
Macaroni, 2-inch .....	76	381	762	.....	1
English walnuts .....	80	400	800	2,000	2
Rolled oats .....	84	420	840	2,100	1½

<sup>1</sup>Variations in margin allow for differences in commodities—whether or not they level down readily, may pile when scoop is thrust into bin, etc. The second figure for flour is the margin that permits keeping a sifter in the bin.

Table C-11. POSSIBILITIES IN SECTIONING DRAWERS FOR STORAGE OF DRY COMMODITIES, AND SIZES OF SECTIONS IN RELATION TO SIZE OF DRAWER.

Overall width and depth of drawers	Drawer plan		Approximate inside widths and depths of sections <sup>2</sup>
	Designation <sup>1</sup>	Number of sections	
<i>Inches</i>			<i>Inches</i>
12 x 18 .....	A	2	5 x 17 (2 sections)
12 x 18 .....	B	3	5 x 10 (2 sections) and 6 x 10
14 x 18 .....	A	2	6 x 17 (2 sections)
14 x 18 .....	A	2	5 x 17 and 7 x 17
14 x 18 .....	B	3	6 x 10 (2 sections), 8 x 10
16 x 18 .....	A	2	7 x 17 (2 sections)
16 x 18 .....	B	3	7 x 10 (3 sections)
18 x 18 .....	A	2	8 x 17 (2 sections)
18 x 18 .....	C	3	5 x 17 (2 sections) and 6 x 17
12 x 22 .....	A	2	5 x 21 (2 sections)
12 x 22 .....	B	3	5 x 10 (2 sections) and 11 x 10
14 x 22 .....	A	2	6 x 21 (2 sections); or 5 x 21 and 7 x 21
14 x 22 .....	B	3	6 x 10 (2 sections) and 13 x 10
16 x 22 .....	A	2	7 x 21 (2 sections); or 6 x 21 and 8 x 21; or 5 x 21 and 9 x 21
16 x 22 .....	B	3	7 x 10 (2 sections) and 15 x 10; or 6 x 10, 8 x 10 and 15 x 10
18 x 22 .....	A	2	8 x 21 (2 sections); or 7 x 21 and 9 x 21; or 6 x 21 and 10 x 21
18 x 22 .....	B	3	8 x 10 (2 sections) and 17 x 10; or 7 x 10, 9 x 10, and 7 x 10; or 6 x 10, 10 x 10, and 17 x 10
18 x 22 .....	C	3	5 x 21 (3 sections)

<sup>1</sup>Designation for plan of drawer.



<sup>2</sup>Measures allow for removable insets of metal or dividers of ¾-inch plywood.

Table C-12. NUMBER OF COMMODITIES<sup>1</sup> THAT MAY BE STORED IN COMPARTMENTS OF SPECIFIED SIZES IN 6-POUND AND IN 12-POUND LOTS.

Inside width and depth of section	Commodities that may be stored in compartment of specified inside height in 6-pound and in 12-pound lots <sup>2</sup>													
	5 inches		6 inches		7 inches		8 inches		9 inches		10 inches		11 inches	
	6 pounds	12 pounds	6 pounds	12 pounds	6 pounds	12 pounds	6 pounds	12 pounds	6 pounds	12 pounds	6 pounds	12 pounds	6 pounds	12 pounds
<i>Inches</i>														
5 x 10 .....	3	none	9	none	13	1	15	1	17	3	19	8	19	10
6 x 10 .....	9	none	13	1	15	1	17	7	19	8	all	12	all	13
7 x 10 .....	12	1	15	1	17	7	19	8	all	12	all	13	all	15
8 x 10 .....	13	1	17	3	19	8	all	12	all	13	all	16	all	17
9 x 10 .....	15	1	19	7	all	12	all	13	all	15	all	17	all	19
10 x 10 .....	17	3	19	9	all	13	all	15	all	17	all	19	all	19
11 x 10 .....	19	7	all	12	all	13	all	17	all	17	all	19	all	all
12 x 10 .....	19	8	all	13	all	15	all	17	all	19	all	all	all	all
13 x 10 .....	19	10	all	13	all	17	all	19	all	19	all	all	all	all
14 x 10 .....	all	12	all	15	all	17	all	19	all	all	all	all	all	all
15 x 10 .....	all	12	all	15	all	19	all	all	all	all	all	all	all	all
16 x 10 .....	all	13	all	17	all	19	all	all	all	all	all	all	all	all
17 x 10 .....	all	14	all	17	all	19	all	all	all	all	all	all	all	all
5 x 17 .....	14	1	17	7	19	10	all	13	all	13	all	16	all	17
6 x 17 .....	17	4	19	10	all	13	all	15	all	17	all	19	all	19
7 x 17 .....	19	8	all	12	all	15	all	17	all	19	all	all	all	all
8 x 17 .....	all	10	all	13	all	17	all	19	all	all	all	all	all	all
5 x 21 .....	17	5	19	10	all	13	all	16	all	17	all	19	all	all
6 x 21 .....	19	10	all	13	all	16	all	18	all	19	all	all	all	all
7 x 21 .....	all	12	all	15	all	19	all	19	all	all	all	all	all	all
8 x 21 .....	all	14	all	17	all	19	all	all	all	all	all	all	all	all
9 x 21 .....	all	15	all	19	all	all	all	all	all	all	all	all	all	all

<sup>1</sup>Out of 21 commodities for which volume of specified weight is given in Table C-10. The commodities are: Brown sugar, cornmeal, cracked hominy, cracked wheat, English walnuts, farina, filberts, granulated sugar, hominy grits, lima beans, macaroni (2-inch), minute tapioca, navy or red beans, pearl barley, prunes, rice, rolled oats, salt, seedless raisins, white flour, and whole wheat flour. Dimensions allow margins over contents listed in Table C-10.

<sup>2</sup>Since the 21 commodities listed in Table C-10 are ranked lowest to highest in storage volume, a specific number shows not only how many but what commodities may be accommodated. That is, "15" in the above table means that any one of the first 15 listed in Table C-10 may be accommodated. Assuming a difference of one inch between inside and overall vertical dimensions of drawer, the data in this table apply to drawers ranging from 6 to 12 inches in height.

Table C-13. NUMBER OF KINDS OF FOOD MATERIALS THAT MAY BE ACCOMMODATED IN 12-POUND AND 30-POUND LOTS IN STORAGE SPACES OF SPECIFIED SIZES.<sup>1</sup>

a. TWELVE-POUND LOTS

Dimension of drawer		Number of commodities that may be stored in drawers of specified inside height			
Overall width x depth	Inside width x depth	5 inches	6 inches	7 inches	8 inches
<i>Inches</i>	<i>Inches</i>				
10 x 18	9 x 17	13	17	19	all
12 x 18	11 x 17	15	19	all	all
14 x 18	13 x 17	19	all	all	all
16 x 18	15 x 17	all	all	all	all
18 x 18	17 x 17	all	all	all	all
10 x 22	9 x 21	15	19	19	all
11 x 22	10 x 21	17	19	all	all
12 x 22	11 x 21	19	all	all	all
13 x 22	12 x 21	19	all	all	all
14 x 22	13 x 21	19	all	all	all
15 x 22	14 x 21	all	all	all	all
16 x 22	15 x 21	all	all	all	all

b. THIRTY-POUND LOTS

Dimension of drawer		Number of commodities that may be stored in drawers of specified inside height						
Overall width x depth	Inside width x depth	5 inches	6 inches	7 inches	8 inches	9 inches	10 inches	11 inches
<i>Inches</i>	<i>Inches</i>							
10 x 18	9 x 17	none	1	1	7	8	12	13
12 x 18	11 x 17	1	1	7	11	13	13	16
14 x 18	13 x 17	1	7	11	13	15	17	17
16 x 18	15 x 17	4	10	13	15	17	19	19
18 x 18	17 x 17	8	12	15	17	19	all	all
10 x 22	9 x 21	1	2	8	11	13	15	17
11 x 22	10 x 21	1	7	9	12	13	16	17
12 x 22	11 x 21	1	8	12	13	16	17	19
13 x 22	12 x 21	3	10	13	15	17	17	19
14 x 22	13 x 21	7	12	13	16	17	19	all
15 x 22	14 x 21	8	12	15	17	19	all	all
16 x 22	15 x 21	10	13	16	18	19	all	all

<sup>1</sup>Out of 21 commodities for which volume of specified weight is given in Appendix Table C-10. The commodities are: Brown sugar, cornmeal, cracked hominy, cracked wheat, English walnuts, farina, filberts, granulated sugar, hominy grits, lima beans, macaroni (2-inch), minute tapioca, navy or red beans, pearl barley, prunes, rice, rolled oats, salt, seedless raisins, white flour, and whole wheat flour. Dimensions allow margins over contents listed in Table C-10.

Table C-14. STORAGE REQUIREMENTS OF BREAD AND CAKE.

Material stored	Dimensions of material length x width x height
<i>Bread:</i>	<i>Inches</i>
Homemade, single loaf .....	9½ x 5½ x 5
Purchased <sup>1</sup> .....	13 x 6½ x 5
<i>Cake:</i>	
Round, loaf .....	10½ x 10½ x 5
Square, loaf .....	9 x 9 x 2½
Round, two-layer .....	9 x 9 x 4

<sup>1</sup>Maximum for each measure, except length of French bread, 20 inches. From summary of dimensions of 25 kinds of bread carried in two Corvallis stores.

Table C-15. UNIT DIMENSIONS FOR DRAWERS AND SHELVES PLANNED FOR THE STORAGE OF FARM AND HOME BUSINESS MATERIALS.

Material stored	Unit dimensions <sup>1</sup>		
	Minimum width of shelf or depth of drawer	Length of shelf or width of drawer section	Minimum clearance above shelf, or inside height of drawer
	<i>Inches</i>	<i>Inches</i>	<i>Inches</i>
Books .....	8	1½	12
Bulletins in box .....	8	2	12
Catalogs stored flat; instruction book .....	10 or 13½	14 or 10½	5
Account and record books, stored flat .....	11½	17	5
Letter paper in box .....	9 or 12	13 or 9	5
Box of 500 small envelopes .....	12 or 7½	8 or 12½	6
Box of 500 large envelopes .....	10½ or 14½	15 or 11	6
Steel strong box .....	13½ or 8½	9 or 14	6
Portable steel index file .....	13½ or 6½	7 or 14	13
Cardboard letter file .....	12½	4	13
Recipe file .....	7½ or 5	5½ or 7½	6
Letters, folded; receipts, vouchers (pigeon holes or section) .....	10	2	5
Pencils, cash, stamps, etc. (sectioned drawer) .....	8	8	1½
Correspondence in Manila folders .....	.....	12½	11
Portable radio .....	12	20	12
Desk telephone, used in place .....	8	12	12

<sup>1</sup>When two measures are given, they should be paired in the order given. For example, shelf width and length for catalogs may be 10 x 14 inches or 13½ x 10½ inches.

Table C-16. UNIT MEASURES FOR THE STORAGE OF SEWING EQUIPMENT AND SUPPLIES.

Material stored	Unit measures
Sewing machine	
Drop head, treadle .....	End of machine parallel to back wall Compartment 22" x 37" x 32" height Side of machine parallel to back wall Compartment 40" x 20" x 32" height
Portable electric, in case....	Height of compartment or distance between shelves, 18 inches Depth and width of compartment or shelving: end of machine parallel to wall, 10 x 18 inches; side of machine parallel to wall, 19 x 9 inches
Minor sewing equipment and supplies .....	Shelf spacing for trays or boxes, if uniform, 9 inches Inside width of tier of drawers, 16 to 30 inches Inside height of drawers or trays for specific uses <sup>1</sup> Thread, scissors, needles, etc., 3 inches Patterns, stored vertically on side, 7 inches Patterns, stored vertically on end, 10 inches Mending scraps, 6 to 8 inches Unfinished articles, folded, 6 to 8 inches New goods, 6 to 8 inches Articles to be mended, 6 to 8 inches Shelf space, style books, 15 x 11 inches
Garments under construction..	Minimum lateral dimensions of hanging space, 22 x 6 inches Hook or rod for hangers, 63 inches from floor, 11 inches from wall

<sup>1</sup>Add 1 inch for overall height of drawer or clearance between shelves.



Table C-17. UNIT MEASURES FOR THE STORAGE OF WORK CLOTHES AND CHILDREN'S WRAPS.

Material stored	Unit measures
Wraps, adults' .....	Hooks for coats, sweaters Number of hooks per user—2 Distance apart, 12 inches Distance from tip of hook to shelf, 3 inches Distance from tip of hook to bottom of garment Short coats, sweaters, 36 inches Long coats, 48 inches Shelf for caps, hats, gloves Width, 12 inches Length per user, 12 inches Minimum clearance over shelf, 10 inches Shelf for boots, galoshes Width, 15 inches Distance to floor, 8 inches Minimum clearance over shelf Galoshes, rubbers, 9 inches High boots, 17 inches Length, per pair Galoshes, rubbers, 10 inches Boots, 12 inches Drawer for gloves, caps, etc. Minimum inside height, 4 inches Drawer for overshoes, rubbers, house shoes Minimum inside height, 6 inches
Wraps, children's .....	Hooks for coats Distance apart, 9 inches Height from floor, 30 to 45 inches Number hooks per user, 2 Shelving for caps, mittens Width, 10 inches Length per user, 12 inches Minimum clearance above shelf, 8 inches Shelving for galoshes, rubbers Minimum width, 10 inches Length per user, 10 inches Minimum clearance over shelf, 10 inches
Aprons, smocks .....	Hooks Distance apart, 5 inches Distance from floor, 56 inches

## APPENDIX D. SUPPLEMENTARY DATA ON SPACE REQUIREMENTS OF WORKERS

Table D-1. DISTRIBUTION OF OREGON AND WASHINGTON WOMEN WITH RESPECT TO HEIGHTS CHOSEN FOR ROLLING WITH A ROLLING PIN, BEATING WITH A ROTARY BEATER, WASHING DISHES, IRONING, AND CUTTING OUT GARMENTS.<sup>1</sup>

Height	Co-operators choosing height for specified activity									
	Rolling		Beating		Dishwashing		Ironing		Cutting	
	Num- ber	Per- cent	Num- ber	Per- cent	Num- ber	Per- cent	Num- ber	Per- cent	Num- ber	Per- cent
26 inches <sup>2</sup> .....			1	0.2						
27 inches .....			5	1.1						
28 inches .....			11	2.3	2	0.4				
29 inches .....	1	0.2	18	3.8	18	3.2	6	1.3		
30 inches .....	7	1.2	86	18.1	43	7.6	33	6.9		
31 inches .....	38	6.8	133	28.0	102	18.2	81	17.1	6	1.7
32 inches .....	80	14.2	104	21.9	170	30.2	133	28.0	17	4.7
33 inches .....	167	29.7	70	14.7	148	26.3	135	28.4	57	15.7
34 inches .....	140	24.9	33	7.0	59	10.5	57	12.0	65	18.0
35 inches .....	76	13.5	9	1.9	13	2.3	20	4.2	66	18.2
36 inches .....	34	6.1	3	0.6	6	1.1	9	1.9	68	18.8
37 inches .....	9	1.6	1	0.2					40	11.1
38 inches .....	7	1.2	1	0.2	1	0.2	1	0.2	25	6.9
39 inches .....	1	0.2							11	3.0
40 inches .....	1	0.2							4	1.1
41 inches .....	11	0.2							2	0.5
42 inches .....										
43 inches .....									1	0.3
44 inches .....										
TOTALS .....	562	100.0	475	100.0	562	100.0	475	100.0	362	100.0

<sup>1</sup>From Oregon Experiment Station Bulletin 348, *Standards for Working-surface Heights and Other Space Units of the Dwelling*, Table 3, p. 14. Averages of preferred heights are: rolling, 33.7 inches; beating, 31.6 inches; dishwashing, 32.3 inches; ironing, 32.6 inches; cutting, 35.4 inches.

<sup>2</sup>26.0 inches and less than 27.0 inches. Subsequent groups similarly defined.  
(Italics indicate heights chosen by greatest number of women.)

Table D-2. PERCENTAGE DISTRIBUTION OF 562 WOMEN WITH RESPECT TO DISTANCE FROM FLOOR TO THUMB TIP WHEN ONE ARM IS UPSTRETCHED.<sup>1</sup>

Distance <i>Inches</i>	Women with specified measure	
	Distance to thumb tip <i>Cumulative per cent</i>	Distance to wrist <i>Cumulative per cent</i>
65 <sup>2</sup>	.....	100.0
66	.....	99.5
67	.....	99.1
68	.....	98.2
69	100.0	96.6
70	99.8	93.9
71	99.3	89.7
72	99.1	83.6
73	97.7	74.5
74	94.9	63.5
75	92.6	51.1
76	87.6	40.4
77	81.0	26.3
78	71.9	16.5
79	61.0	10.3
80	48.6	6.4
81	38.6	3.5
82	25.4	2.3
83	16.7	1.4
84	9.8	1.1
85	5.9	0.6
86	3.9	.....
87	2.5	.....
88	1.4	.....
89	1.1	.....
90	0.9	0.2
91	.....	.....
92	.....	.....
93	.....	.....
94	.....	.....
95	.....	.....
96	0.2	.....

<sup>1</sup>Oregon Experiment Station Bulletin 348, *Standards for Working-surface Heights and Other Space Units of the Dwelling*, Abstract of Table 6, p. 21.

<sup>2</sup>65.0 inches and less than 66.0 inches. Subsequent groups similarly defined.

Table D-3. MAXIMUM DISTANCES FROM FLOOR OF ROOM TO TOPS OF SHELVES, KNOBS, ETC., AND CLOSET ROD, ESTIMATED FROM HEIGHT OF REACH OF CO-OPERATORS.<sup>1</sup>

Item	Suggested height <sup>2</sup>		
	Suited to 60 per cent of co-operators	Suited to 80 per cent of co-operators	Suited to 99 per cent of co-operators
	<i>Inches</i>	<i>Inches</i>	<i>Inches</i>
Shelves for books, light-weight utensils, or packaged groceries			
No obstruction	79	77	72
12-inch obstruction	76	74	69
Shelves for stacks of plates, glasses, hats, or bedding <sup>3</sup>			
No obstruction	74	72	67
12-inch obstruction	71	69	64
Knobs, etc. <sup>4</sup>			
No obstruction	79	77	72
12-inch obstruction	76	74	69
24-inch obstruction	69	67	62
Closet rod	81	79	74

<sup>1</sup>Oregon Experiment Station Bulletin 348, *Standards for Working-surface Heights and Other Space Units of the Dwelling*, Table 7, p. 23.

<sup>2</sup>Height given is lower limit when co-operators are classified by one-inch differences.

<sup>3</sup>Assume that both hands will be needed to grasp objects, also that they may be used for shelves intended for objects likely to be placed behind one another, such as goblets.

<sup>4</sup>Knobs and latches for upper cabinets; switches and controls for lights, fans, ventilators; window locks; and hooks.

## APPENDIX E. DEFINITIONS

### Measures

- DEPTH— 1. The inside or outside front-to-back measure of drawer or compartment.  
2. The inside perpendicular measure of a sink bowl, drawer, etc. The term "inside height" is used in this bulletin to denote this measure, unless contrasts are stated or implied.

- HEIGHT— 1. Distance from floor of room of the top or a designated point on an object; for example, height of sink.  
2. Net vertical measure, either inside or outside; for example, drawer.

LENGTH—The longer measure, as of a stored object, a shelf or board, or a floor area.

- WIDTH— 1. The shorter measure, when the longer one has been designated by the term "length," for example, shelf.  
2. The middle one of three measures, when the other two are designated by "length" and "thickness," for example, piece of lumber.  
3. The side-to-side measure of a drawer or cabinet.

INSIDE DEPTH, WIDTH, AND HEIGHT—Dimensions of the space within an enclosure. Inside measures plus thickness of materials equal over-all measure.

OVER-ALL DEPTH, WIDTH, AND HEIGHT—

Measures taken on the outside of drawer or cabinet. Excludes apertances such as hardware, lip extension of drawer, or trimming pieces.

The over-all depth of a base cabinet is measured at a point between the top and bottom of the compartment (base cabinet with shelves) or between the top of the topmost opening and bottom of the lowest one.

The over-all depth of a counter is measured on the top of the counter.

### Parts of Cabinet

APRON—Facing strip below counter.

COMPARTMENT—Space in cabinet which is closed by doors or curtains. May contain hooks, shelves, trays, drawers, or may be without fittings.

COUNTER—Board at top of a base cabinet. Usually finished for use as a work surface.

COUNTER OVERHANG—Part of counter which protrudes beyond the face of the base cabinet.

DIVIDER—Construction member between drawers.

FACING STRIP—Vertical strip at sides of compartment or drawers.

PULL-OUT BOARD—A board kept in a slot cut in the apron or formed by two dividers.

TIER—Two or more drawers of the same width, placed in a vertical series.

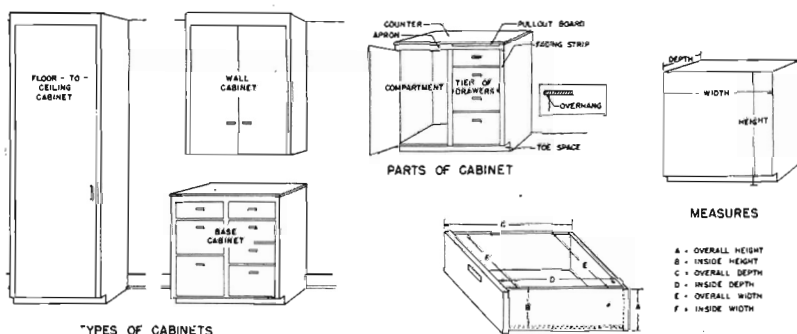
TOE SPACE—A recess at the base of a cabinet.

## Types of Cabinets

**BASE CABINET**—One of the requisite depth and height for the top to be suitable for use as a work surface.

**FLOOR-TO-CEILING CABINET**—One in which no work surface is provided; usually extended to ceiling or dropped ceiling.

**WALL CABINET**—One that is fastened to wall above base cabinet, or above range, refrigerator, or other purchased equipment.



RESEARCH IN AGRICULTURE AND HOME ECONOMICS	OREGON STATE COLLEGE CORVALLIS, OREGON	PLANNING KITCHEN CABINETS JULY 1946	DEPT. OF AGR. ENG. & HOME ECON. OREGON AGR. EXPERIMENT STATION
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Figure 14. Terms used in describing kitchen cabinets.

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