

Chapter Five

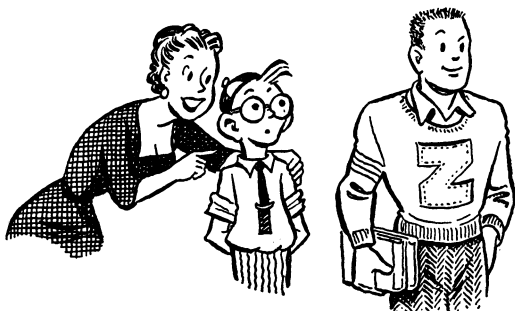
What Should You Teach?

TECHNOLOGY IS AFFECTING the form and quality of food so that adequate and attractive meals are easily available to most families. However, it is a mistake to assume that diets will be improved automatically. Well-planned nutrition education is as important now as it always has been.

There are many ways to teach nutrition and all of them can make important contributions to nutrition education. Whether you publish articles, books, or pamphlets; give talks or teach lessons to organized groups — you are teachers concerned with changing members of your audience in various ways. This is education: the process of changing behavior in desirable directions.

Behavior as defined here refers to all forms of activity: it includes such processes as thinking and feeling as well as more visible activities; it applies to covert as well as overt actions. When objectives are stated as behaviors, attention is focused on what you hope will happen to students as a result of your teaching.

*... attention is
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result of your teaching.*



There are four parts to a plan for teaching: objectives, generalizations or concepts, learning experiences, and evaluation. Each of these has a unique function:

Objectives guide the selection and use of the other three

Generalizations or concepts indicate content

Learning experiences describe opportunities for learning so that objectives may be reached

Evaluation indicates how well learning is taking place

You are most likely to educate people as you desire if you find answers to four questions:

1. What educational objectives should guide my teaching?
2. What generalizations or concepts do I want learners to know and be able to apply as one means of reaching objectives?
3. What opportunities can I provide for learners to reach the objectives? ¹
4. How can the effectiveness of these learning experiences be evaluated? ²

SELECTING AND WRITING OBJECTIVES

The ways in which you wish to change people are your objectives and so, to be most useful, they are stated as desirable behaviors of learners. When objectives are stated as broad educational outcomes they can give you a sense of direction for your teaching. The objectives indicated by Roman numerals I through VI on the following pages are examples of this type of objective.

When, however, objectives are stated only in broad general terms, they have limited use when selecting generalizations or when planning for experiences and evaluation. You need to know what students can *do* when they have achieved the objectives. The more specific behaviors are illustrated by the objectives indicated with italicized letters following each Roman numeral.

As a result of your teaching do you expect people to be better able to think for themselves? You cannot be sure to reach this goal unless you know the behaviors to expect when one has learned to think. These behaviors range from the simplest, such as recall of facts, to complex intellectual abilities and skills, such as ability to solve problems or to evaluate a plan.

Even when you believe that knowledge of nutrition is important, would you be willing to accept this as the primary goal of your teaching? Probably not. You will want individuals to plan for good nutrition in whatever situation they may find themselves. To do this they must be able to find and use appropriate information and techniques

¹ This question is discussed in Chapter 7, "Methods of Teaching."

² This question is discussed in Chapter 8, "Evaluation."

to solve their problems. It is the specific kinds of information or the specific techniques needed to solve the problems selected for consideration that will be useful when planning for teaching.

This belief about objectives guided the preparation of those suggested on the following pages. In order to identify the behaviors which would indicate that individuals were reaching each of the objectives I through VI, answers were found to the following questions:

What knowledge is needed to develop each ability?

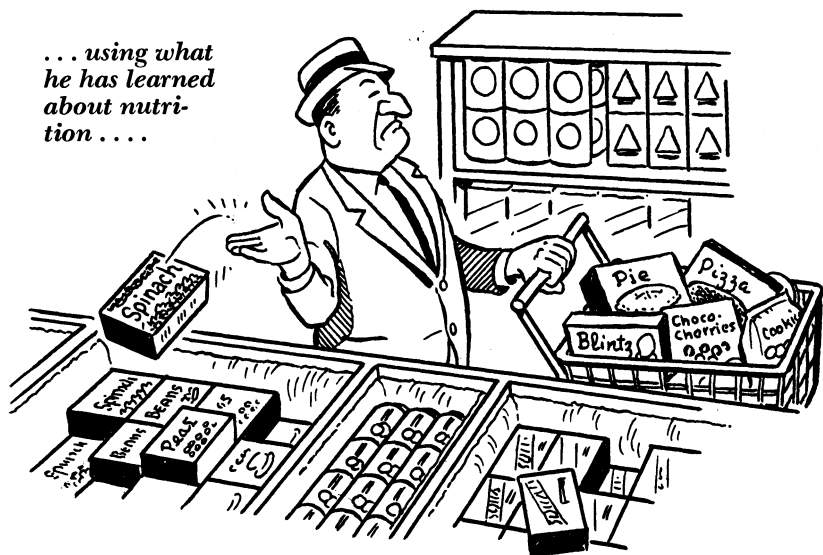
What facts? What terminology? What criteria? What generalizations? What techniques?

What intellectual skills and abilities are needed?

What must be comprehended? To what situations should generalizations be applied? What planning is necessary? What judgments are desirable? What evaluation is needed?

As you answer these questions, you identify the kind of competence you expect. The behaviors suggested in the following objectives are relatively simple because they indicate the kind of competences you might expect of students with limited background for understanding nutrition. When planning for individuals with an extensive background you would expect different kinds of behavior. For example, instead of knowing how to use a food guide as a basis for planning, you might desire ability to calculate the amounts of nutrients in a day's dietary.

In nutrition education, changing the way people think is not enough. The food practices of people may be influenced more by the way they feel than by what they think. How well an individual uses what he has learned about nutrition is influenced by his attitudes, his interests, what he appreciates and enjoys, his values, and the goals he has for reaching values. Since these behaviors influence what a student is likely to learn, they are important in any set of objectives.



OBJECTIVES FOR NUTRITION EDUCATION

As a result of nutrition education, people will be better able to:

- I. Appreciate the relationship between goals of individuals and the kind and distribution of foods which they eat because they:
 - A. Comprehend how nutrition influences different parts of the body and the characteristics which relate to personal appearance.
 - B. Comprehend how nutrition influences personality.
 - C. Comprehend how nutrition influences efficiency.
 - D. Comprehend how nutrition influences growth and development through its interplay with heredity and environment.
 - E. Know the characteristics which reflect nutritional state.
 - F. Comprehend how physical condition influences utilization of nutrients.
 - G. Accept the validity of findings that result from sound research.
- II. Extend the variety of foods eaten and enjoyed by themselves and others when they:
 - A. Comprehend how such factors as customs, nationality, and religion influence food preferences and practices.
 - B. Comprehend how age, physical state, and emotions influence food preferences and practices.
 - C. Are willing and able to identify probable causes of refusal to eat rejected foods.
 - D. Comprehend ways to overcome food dislikes of themselves and others.
 - E. Are willing to experiment with ways to overcome food dislikes or to improve distribution of foods in meals and snacks.
 - F. Develop skill in food preparation to increase acceptance and conserve nutrients.
 - G. Are willing and able to assume responsibility for their own nutrition.
- III. Plan and prepare nutritious meals and snacks because they:
 - A. Know how to use a food guide as a basis for planning.
 - B. Know the foods that are classified in each food group.
 - C. Comprehend the functions of nutrients and chemical substances in the body.
 - D. Know contributions of usual servings of foods to daily requirements of nutrients.
 - E. Know how to adjust calorie intake to needs of individuals.
 - F. Comprehend how nutrient requirements change with age.
 - G. Can judge the adequacy of meals by sound criteria.
- IV. Plan the use of resources for providing food for themselves and others because they:
 - A. Comprehend the relationship between a food budget, nutritious meals, and food preferences.

- B. Know relative costs of foods which contain comparable nutrients.
 - C. Develop skill in planning meals that can be provided within limitations of time, energy, and money.
 - D. Develop judgment in buying foods of suitable quality for use.
 - E. Can evaluate the worth of processed foods such as packaged mixes, frozen foods, and ready-prepared meals.
 - F. Can evaluate the usefulness of vitamin supplements.
 - G. Know how to care for and store foods to prevent spoilage.
 - H. Comprehend the significance of government grading of food.
 - I. Know the major regulations of the Pure Food and Drug Act as they apply to household marketing.
- V. Evaluate beliefs about food because they:
- A. Know appeals used in advertising foods .
 - B. Are skillful in distinguishing facts from hypotheses.
 - C. Use sound criteria for judging sources of nutrition information.
 - D. Comprehend how food fads develop.
 - E. Are able to identify and appraise values that are involved in food practices.
 - F. Apply generalizations of nutrition when evaluating a food practice.
 - G. Comprehend factors that influence the health of individuals.
 - H. Appreciate the importance of continually checking nutritional states.
 - I. Keep up to date with research findings in nutrition.
- VI. Evaluate the worth of programs for the welfare of families, communities, and nations because they:
- A. Know the effects of nutrition upon the mental and physical health of individuals.
 - B. Know the effects of nutrition on relationships among people.
 - C. Know the relationship of nutrition to world problems and conditions.

Objectives as comprehensive as these cannot be achieved by the efforts of one person alone•or by one group of individuals in a com-

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munity. But cooperation among the individuals concerned with nutrition education can be expected to bring best results when they plan programs to reach all family members at approximately the same time. The over-all objectives for all groups may be the same, but the methods will be keyed to the age, responsibilities, and interests of the immediate group.

Nutrition education is likely to be ineffective if an individual is reached during just one period in his lifetime. Information acquired at one period may not be that which is needed for solving problems later on. Furthermore, knowledge of nutrition is constantly increasing. Food technology has changed the availability of some foods, and in some instances nutritive value, also. The readiness of people to learn may change with age and responsibility. Thus there is good reason to plan nutrition education for all groups in a community.

Readiness to learn will be influenced by the ages, responsibilities, and experiences of members of a group. Some experiences need not be repeated when the same individual is taught nutrition at different periods of his life. The factors that influence readiness to learn are discussed in detail in Chapter 7.

When you have selected the objectives that are appropriate for the group you plan to teach, you will wish to assemble the facts that must be understood if the objectives are to be achieved. The facts presented in the following chapter are organized to facilitate such planning.

SELECTING AND USING GENERALIZATIONS

When you have determined the objectives for your teaching, the next step is to decide what knowledge is needed to achieve them. One way to make this decision is to select generalizations that are appropriate for the group to be taught. *Generalizations are statements supported by facts or beliefs that apply in situations beyond those in which the generalization is learned.* A generalization states some relationship between two or more concepts. One generalization in nutrition that you might wish to develop with students is: *Good nutrition requires that the nutrients (or chemical substances) needed by the body for its functions be provided in ample amounts* (p. 132).

Concepts in this generalization have been italicized for emphasis. *Concepts are ideas or notions that one has about something.* In education our concern is that concepts be accurate, clear, and as complete as possible.

You may have called the above generalization a principle and you would be right. Generalization is a generic term which includes principle. There are no generally accepted criteria for differentiating between generalizations, principles, laws, rules, or facts of broad application. In this book, however, the term *generalization* is used to describe a statement of fact or belief that organizes ideas.



Importance of Organized Knowledge

Facts of nutrition are of little use unless they can be applied in situations in which students are likely to find themselves. This calls for organization. Knowledge which is organized is retained better than facts which are specific and isolated. Thus learning is more efficient.

Furthermore, facts learned in isolation can be used again only when like situations are encountered. Only as students form concepts, see relationships among them, and arrive at generalizations can they transfer what they have learned to new situations.

~~Generalizations can guide you in selecting the facts that you will teach.~~ As knowledge of nutrition increases, there is danger that learning will be superficial. Accurate and complete concepts and generalizations require time for their formation. Thus you are faced with the necessity of selecting what you will teach. This selection can be guided by a set of generalizations that you believe your students should understand and apply because these will indicate the facts to be known, and concepts to be developed. Since the learner develops concepts from his own experience, time is needed to form new concepts or to change those that are undesirable. Many of his concepts of nutrition are false or incomplete but since they are his, he may defend them vehemently. Re-education is the way to change them. Telling him that he is wrong may do little but build resistance to change. What he needs is opportunities to build new, accurate concepts that are his own. These will replace the inaccurate ones if you allow time for him to have the needed experience.

The basic process of acquiring concepts is the differentiation of details and the organization of these details so that similarities and differences are evident. If you wished to develop the concepts in the generalization given above, you might start with the concept, *good nutrition*. As a first step you could ask yourself the question: How can I increase the ability of students to observe details and to identify characteristics that distinguish good nutrition from poor?

Since the most obvious characteristics are physical ones, you might start by showing pictures of the girls, Figures 5.1A, B, C, and D. If you ask students to point out characteristics that are different for the two girls without showing the lists given on the same page, they would be required to think rather than memorize and you would have some evidence of their abilities to observe details and to identify differences and similarities. At the same time misconceptions would be evident. If students seem to need more experience of a similar nature, you could show pictures of different ages, both men and women, with special emphasis on the age and sex of most concern to your students.

CHARACTERISTICS OF GOOD NUTRITION

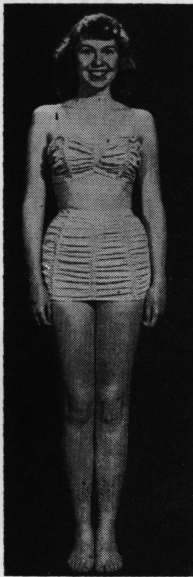


FIG. 5.1A

Shiny, luxuriant hair

Sparkling eyes

Well-formed teeth

Square shoulders

Straight spine

Alert posture

High vitality

Firm muscles

Proper weight for height and age

Straight legs

Well-arched feet

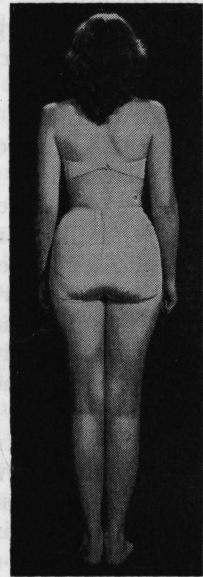


FIG. 5.1B

CHARACTERISTICS OF POOR NUTRITION

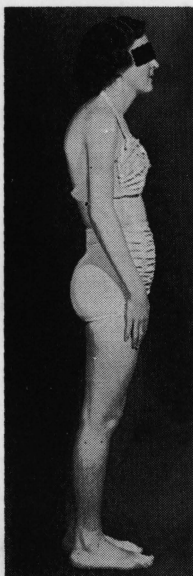


FIG. 5.1C

Dull hair

Narrow, round shoulders

Curved spine

Sagging, poor posture

Low vitality

Poor muscle tone

Underweight for height and age

Slightly knock-kneed

Flat feet

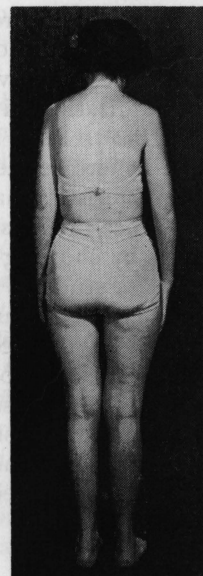


FIG. 5.1D

Since varied experiences are most effective in concept formation, you might plan different experiences that would clarify the concept of *good nutrition*. Animal-feeding experiments or observation of children or of one's own age mates could provide opportunities to distinguish the physical characteristics of persons with good nutrition.

By this time students should be ready to organize their learning. If you ask them what they have learned about the physical characteristics of a person with good nutrition, they should be able to make accurate statements. They could make statements about poor nutrition also. As they verbalize the concept of good nutrition, they as well as you will have a basis for knowing what they have learned.

Students can evaluate their own statements by comparing them with those of authorities in reference books or pamphlets. Reference reading will have more meaning for students when they have had some experience related to what they read; they will be motivated to read when a purpose for their reading is evident to them.

If you want to broaden the concept of good nutrition to include how one feels and acts, quite different experiences could be planned. A film such as, *It's All In Knowing How* (1), could be discussed following a plan for discussion such as the one suggested on page 174. Before accepting all of the ideas presented in the film, students could read such references as Leverton, *Food Becomes You* (2), and King and Lam, *Personality "Plus" Through Diet* (3).

Students have been introduced to the other concepts in the generalization being developed — nutrients, body functions, and ample amounts — but such indirect consideration of these is not enough. Probably, you will want to provide opportunities for students to clarify these concepts and make them more specific.

Adaptation of Organized Knowledge

It is difficult to discuss the concept of nutrients without giving consideration to their function in the body. To introduce such a discussion you might want students to comprehend such facts as:

Each day our bodies need to be supplied with many different nutrients:

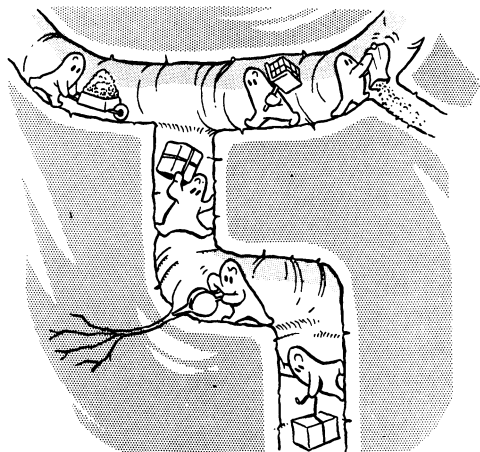
Protein for growth and repair of the body

Minerals and vitamins for growth and to keep the body functioning properly

Fat and carbohydrate for energy

Water and oxygen, often not included as nutrients, are necessary before the body can use the food taken in

Most foods contain more than one nutrient, but no single food contains all of them in the amounts needed. Choosing foods wisely means selecting kinds that together supply nutrients in the amounts needed by the body.



Building and regulative materials are carried to areas which need them.

Food is first masticated and mixed with saliva in the mouth and is carried to the digestive tract. Here it is digested and absorbed by the blood stream which carries it to the cells in all parts of the body. The red cells in the blood also pick up oxygen from the lungs and take it to the cells. Nutrients and oxygen combine (or "oxidize") and energy, measured in calories, is released for the needs of the body. Building and regulative materials such as protein, minerals, and vitamins are carried by the blood to the bones, teeth, muscles, and other tissues and organs which need them. Excesses of some nutrients may be stored for later use, while waste products, along with excess water resulting from digestion and oxidation of food nutrients, are eliminated mainly through the kidneys, intestines, and skin.

To give a concept of how to select ample amounts of foods needed daily, the Institute of Home Economics, Agricultural Research Service of the United States Department of Agriculture developed *Food for Fitness, A Daily Food Guide* (4). In this guide, foods are divided into four broad groups on the basis of their similarity in composition and nutritive value. This guide specifies the number of daily servings needed from each food group to supply the Recommended Dietary Allowances (5) for food energy and nine nutrients. When this food plan is followed, as much choice as possible is allowed while the user is given an assurance of an adequate variety and amount of food.

To introduce *Food for Fitness, A Daily Food Guide*, popularly called the "Basic Four," the teacher may wish to use the wall chart which shows the following four food groups and the number of servings needed per day.³

³ A large wall chart from *Food for Fitness, A Daily Food Guide*, can be obtained upon request from the National Dairy Council, Chicago 6, Ill.

1. Milk Group
 - Children — 3 to 4 cups
 - Teen-agers — 4 or more cups
 - Adults — 2 or more cups
2. Vegetable-Fruit Group
 - 4 or more servings to include
 - a citrus fruit or vegetable important for vitamin C
 - a dark-green or deep-yellow vegetable for vitamin A
 - other vegetables and fruits including potatoes
3. Meat Group
 - 2 or more servings
 - beef, veal, pork, poultry, fish, eggs
 - as alternates
 - dry beans and peas, nuts
4. Bread-Cereal Group
 - 4 or more servings
 - whole grain, enriched, or restored

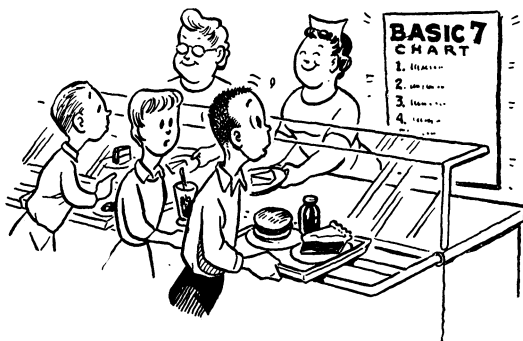
✓ To round out meals and to satisfy the appetite everyone will use some foods not specified — butter, margarine, other fats and oils, sugar, or unenriched refined grain products. These “other” foods supply calories and can add to total nutrients in meals. However, other foods are to be added only after the variety given in the four groups is satisfied or adequate nutrients may not be obtained.

To emphasize the need for distributing foods in three or more meals and snacks during the day, you may wish to supply food models your students can use to arrange food combinations into meals.⁴ This activity permits the development of some ability to select and group, into acceptable meal patterns, the kinds and amounts of food needed for the day. It can also strengthen concepts of kinds and amounts of food to use daily which are important to provide ample nutrients.

If it is desirable to develop the concept of ample amounts of nutrients for a variety of age groups and in conditions of pregnancy and lactation, the teacher is referred to *Food Becomes You* (2). This author uses the *Daily Food Guide* to illustrate how to vary kinds and amounts of food selected from the four food groups while maintaining ample amounts of nutrients for a variety of ages and conditions.

Many food guides have been developed in the past. The teacher may want to mention the “Basic Seven” guide which has been, and still is, in use. In addition there are other daily food intake plans which group foods into nine or eleven different food groups. These plans are more completely subdivided than the Basic Four but can be successfully used as guides. The Basic Four plan, *Food for Fitness* (4),

⁴Food models may be purchased from the National Dairy Council, Chicago 6, Ill.



... the "Basic Seven"
is still in use.

was developed to simplify as much as possible the daily selection of food intake with the belief that people will use a simplified plan more effectively and willingly than a more complicated one.

When students can make accurate statements about the concepts — *good nutrition, nutrients, body functions, and ample amounts of nutrients* — they are ready to organize these into a generalization. This organization must be their own as truly as was the formation of concepts.

You can guide students to form a generalization by asking a question such as: What can you say about the relationship between the amount and kind of food and the functioning of the body of a person with good nutrition?

Students may make statements that are quite different from the generalization with which you started. This is to be expected. Your only concern is that the statements be accurate and as complete as seems reasonable for the group.

When the statements are incorrect or not as complete as you had anticipated, correcting the statements of students does little good because their comprehension is at fault. Reteaching is the only way to improve understanding. You may need to provide opportunities either for students to develop concepts or for relationships among concepts to be clarified. You cannot generalize for your students. A generalization is most useful to the person who formulates it because it then has meaning to him.

Some criteria for stating generalizations may be useful to you.

1. Is the statement a complete sentence?
2. Are the ideas clearly and completely expressed?
3. Does the generalization organize all of the appropriate concepts?
4. Is there a distinction between generalizations based on facts and on beliefs?
5. If the generalization is a simple statement of fact, is the fact so important that it should stand alone?
6. Is the statement free of such undesirable words as "should" or "must"?

7. When statements are of different degrees of breadth, are specific statements grouped to show their relationship to a broad generalization?

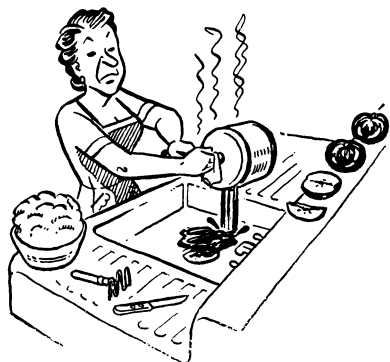
Using a concept in a new situation helps to broaden and clarify it. Relationship to new ideas tends to make it clearer, more accurate, and precise. As the concept of *good nutrition* was developed it was contrasted with poor nutrition. The characteristics of one point up the other. The generalization might be stated this way: A continuous check of the diet is needed to maintain good nutrition and to avoid the bad effects of poor nutrition.

The United States Department of Agriculture has compiled many food values in a series of tables which are sold under the title, *Composition of Foods: Raw, Processed, Prepared*.⁵ Table III in this compilation gives results of analyses of foods in common household measurements. Students can find answers to many questions concerning the nutrient content of a wide variety of foods listed in these tables. If they wish to locate food rich in vitamins A and C, protein, iron, or niacin they can glance up and down the columns of this table until they spot foods with a high nutrient content of the kind they wish to increase in their diet. It is also helpful to let students make comparisons of the calorie and nutrient content of a variety of snack foods and desserts to help them see which ones have in them good nutrient content as well as calories.

Since it is possible to choose foods from the four groups of the *Food for Fitness Guide* and still make errors which can produce inadequacies in the diet, you will want to point out mistakes commonly made in using this guide. For example, size of servings may vary greatly; breads and cereals may not be enriched or of whole grain; vegetables and fruits may be prepared and cooked by poor methods in which they are exposed to air and warmth for long periods of time; mineral and vitamin content of fruits and vegetables may be lost through pouring off liquid in which they are cooked. Some people make the mistake of counting a single food, such as American cheese, in both the meat and milk groups. Or they may count as a full serving food, such as cheese, used in small amounts for flavor or decoration. Others fail to include a high vitamin C food or a dark-green or deep-yellow fruit or vegetable although they eat four or more servings daily from the fruit and vegetable group.

To expand the concept of ample amounts you may lead your students to use the three meals they have planned and check them for number of servings from each of the four food groups in the day's

⁵ Bernice K. Watt and Annabel L. Merrill, "Composition of Foods, Raw, Processed, and Prepared," Agr. Handbook No. 8, U.S. Gov't. Print. Off., Washington, D.C., 1950.



... mineral
and vitamin content
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pouring off liquid ...

food supply. The menu could be placed on the chalk board and evaluated as follows:

Food Group	Number of Servings	Kind of Food	Calories in Average Servings ^a
<i>Breakfast</i>			
Vegetable, Fruit	1	Cantaloupe, 1/2 medium	40
good source of vitamin C			
Bread, Cereal	2	Oatmeal, 1/2 cup	75
enriched or whole grain			
Meat	1/2	Toast, 1 slice enriched	60
Milk	1	Egg, 1 medium	80
		Whole Milk, 1 cup	165
		Total	420
<i>Lunch or Supper</i>			
Meat	1	Lima Beans with Ham	332
		5/6 c. beans plus 1 oz. ham	
Vegetable or Fruit	1	Sliced Tomatoes, 1 medium ..	30
Bread, Cereal	1	Cornbread Muffin, enriched ...	105
		2 3/4 inch diameter	
Milk	1	Buttermilk, or Skim Milk	90
		1 cup	
		Total	557
<i>Dinner</i>			
Meat	1	Lean Roast Beef, 3 ounces	255
Vegetable, Fruit	2	Baked Potato, 1 medium	90
dark-green or deep-yellow			
for vitamin A			
Bread, Cereal	1	Pan Roll, enriched white	115
		1 1/4 ounces	
Milk	1	Whole Milk, 1 cup	165
		Total	653
		Total Day's Calories	1630

The total of 1630 Calories furnished by the foods selected to fulfill the requirements of the *Food for Fitness Guide* are too few for the average adolescent girl or boy, or for adults. The best indication of

^a Caloric values of the foods in these menus were adapted from the table of "Nutrients in Common Foods in Terms of Household Measures" in *Food Becomes You*, by Dr. Ruth M. Leverton, Iowa State University Press, Ames, 1960. Pp. 171-91.

whether or not the food energy of the diet is sufficient is the maintenance of a desirable body weight for age, sex, and height of the individual. When the required number of servings of the "Basic Four" foods have been put in the day's menu, other foods, either in the *Food for Fitness Guide* or out of it, may be eaten to satisfy the appetite and maintain the desirable body weight.

Protein and calcium needs are large during periods of rapid growth so an adolescent boy or girl may wish to increase milk intake for the day either between meals or as a bedtime snack. Two eggs for breakfast, custard or ice cream for dessert, and sandwiches of peanut butter, cheese, egg, or meat could be added to increase these nutrients. Use of additional fruits and vegetables, either during or between meals as snacks, would increase the supply of minerals and vitamins. See *Food Becomes You* (2) for further directions for increasing food intake to meet needs of special age groups, or people under stress such as pregnancy and lactation.

Many tables of height-weight-age averages have been compiled for boys and girls and men and women. Some tables emphasize the wide range of normal variation in weights of individuals due to differences in body structure.

To determine when body weight is at a desirable level, the build of the individual needs to be considered as well as muscle tone or firmness of flesh, sex, age, and height.

Recent tables for height, weight, and age averages for adults were published by the Metropolitan Life Insurance Company in 1959 (6). These weights were for men and women wearing ordinary indoor clothing, and the heights included shoes. The new findings revealed that the average weights for men were about five pounds higher than former studies indicated. This report also gave evidence that weight reduction to a normal level had a favorable effect on vitality and length of life. The American Medical Association has accepted the new findings of the Metropolitan Life Insurance Company as a basis for an exhibit on weight control which was presented in 1960 at the Annual Meeting of the American Medical Association. (See Appendix D.)

For anyone 25 years of age or older it appears to be desirable to maintain a weight at least five pounds beneath the average weight for his height and age. During adolescence it may be an advantage to be five pounds above, rather than below, the average weight for height and age, because of the stress of this period of rapid growth and development. In *Food Becomes You* (2), Dr. Leverton has presented a Physical Growth Record⁷ to be used in evaluating growth during adolescence. These records permit the assessment of growth without

⁷ Individual copies of Physical Growth Record are available at small cost from the American Medical Association, 535 North Dearborn Street, Chicago 10, Ill.

fitting the individual into any one category as is required when height-weight-age tables are used. Such an evaluation is especially desirable during this period between 11 and 18 years of age when great individual variation in growth and development occurs.

When an average desirable body weight has been decided upon, it is possible to estimate the food energy, in terms of calories, needed for maintenance and, in the case of children, for growth as well. The following is a table of approximate calories per pound of desirable body weight needed daily.

Age		Calories per Pound per Day
Infant: birth to one plus years		45-50
Child: 2-10 years — lower than adult man or woman until adolescent growth begins, approximately		35-48
Adolescence		
Boys	13-15 years	29
	16-19 years	26
Girls	13-15 years	24
	16-19 years	20
Adults		
Sedentary — man or woman		16
Active — man or woman		20
Very Active — woman		24
Very Active — man		28
Later half of pregnancy		10-20% increase only
Lactation, for milk production ...		800-1000 Calorie increase

If a more complete discussion of energy needs for various ages and conditions is desired, see *Food Becomes You* (2).

A 6-weeks-old baby whose desired weight is 10 pounds would need approximately $10 \times 50 = 500$ Calories per day to maintain his weight and growth. A 14-year-old, moderately active boy whose desired weight is 78 pounds would need approximately $78 \times 29 = 2262$ Calories to maintain his weight. A 25-year-old sedentary woman who, according to tables, should weight 135 pounds will need approximately $135 \times 16 = 2160$ Calories per day to maintain her weight.

It is wise to weigh every week so that changes in body weight become known before they are too great.

The amount of activity one carries out and the rate of growth during childhood and adolescence can increase the caloric need substantially. The rate at which the body uses food energy is high during the first year, slows down some during childhood, increases again during adolescence, and then gradually slows down again as the individual advances in years.

Continuous checks of the diet and of body weight are important in the maintenance of good nutrition. However, if there is presence of frequent colds or digestive upsets, fatigue, constipation, depression, or hyperirritability one needs to see a physician. He can check with you concerning habits of living which influence utilization of food. In

*Worry and tension
can influence utili-
zation of food.*



addition to wise daily selection of kind and amount of food, other factors essential to good nutrition are: Eight or more hours of sleep; daily outdoor exercise; and freedom from undue worry and tension over work or personal problems of living.

Students of all ages have a tendency to form generalizations only partially supported by facts. Their statements may be strong, positive ones needing considerable qualification. This may be due to incomplete information or unquestioning acceptance of material presented either by the teacher or in references. You can teach students to be critical of their conclusions and thus to generalize more accurately.

APPLICATION OF GENERALIZATIONS

Learning to apply generalizations is another aspect of thinking that is not easy. You are teaching nutrition with the hope that food practices of students will improve and so you will want to teach students to use the generalizations they have learned, when deciding what they will eat. Students of all ages often wish to discuss personal problems that might be solved by applying the generalizations they are learning. If you take time in class to encourage application, students may not know as many generalizations but those they do know will be more meaningful.

When helping students to learn facts and ideas and to generalize them, it is helpful to:

1. Present a few important ideas and stress these throughout the class. Relate any details to the main ideas and facts which are to be emphasized.
2. Write important facts on the blackboard and draw attention to them from time to time during the class.
3. Use demonstrations, charts, graphs, films, and other visual aids whenever possible to point out facts, to illustrate how they are related, or to show situations in which they may be applied.
4. Summarize the important ideas. You may do the summarizing, or you may have students state generalizations if time permits.
5. Apply the generalizations to situations with which the student is familiar.
6. Ask questions which require the application of the generalizations in order to answer them.

The use of generalizations does not stand out as a method in itself but should be a part of all classroom experiences. Thus the methods described in a later chapter are not complete unless students learn to draw conclusions from their experiences and to state their conclusions as generalizations.

PLAN ILLUSTRATING DEVELOPMENT OF GENERALIZATIONS

When teaching a class of seventh-grade boys and girls, Helen Barbour (7) used these steps to guide her students in generalizing. Her lesson plan for teaching the effects of food upon growth is reproduced to illustrate one way of teaching generalizations.

Objectives:

When this lesson is completed, students will be better able to:

1. Recognize how food affects growth of the body.
2. Attain good nutrition because they select foods which provide nutrients in amounts needed by their bodies.
3. Distribute foods wisely in meals and snacks.
4. Maintain the body in a condition favorable for utilization of nutrients.

Generalizations for Teacher Reference:

Generalizations 1E (1-20), pages 122-25, and 5A (2-3), page 132, were used when planning.

Class Discussion:

1. What is normal growth?
 - a. Inherited qualities — can they be changed? If so, how?
 - b. Individuality in rate of growth (rate of growth of girls vs. boys)



Inherited qualities?

Environmental factors?

Height-weight-age tables?

*As you analyze
their suggestions you may
find they need help*



- c. Environmental factors affecting growth rate (food, rest, sunshine, exercise, fresh air, worry and unhappiness, etc.)
 - d. Illness and infections (bad tonsils, poor teeth, rheumatic fever, etc.)
 - e. Height-weight-age tables — how are they used? What does it mean if you are not the weight the tables indicate for your age? (Use weight and height records of pupils.)
2. What influences your height, weight, and body build?
- a. Appetite
 - 1) Regular meals
 - 2) Kind of foods in the meals (satiety value)
 - a) Protein, fat, and sweets slow down hunger contractions
 - b) Fruits, vegetables, and cereals (without fat) leave the stomach quickly
 - 3) Snacks — if properly selected may not ruin appetite for the next meal
 - 4) Exercise, fresh air, rest (enough to allow food eaten to be used well), and sleep help build good appetites
 - b. Amount and kinds of food that help you gain weight
 - c. Amount and kinds of food that help you lose weight
 - d. Need for building materials in a diet either to gain or lose weight (milk, fruit and vegetables, meat, eggs, whole grain or enriched bread and cereals, butter or margarine)

Summary by Students:

You will be given 5 minutes to write sentences that tell what you have learned today. These questions will help you.

- 1. What influences the way you grow?
- 2. What affects your appetite, or lack of it?
- 3. What foods can help you to gain weight?
- 4. What foods should be reduced in amount to lose weight?
- 5. What foods do you need whether you are gaining or losing weight?
- 6. Why is underweight, or overweight, undesirable?

Evaluation:

If students hand in answers to these questions, you will have a basis for determining not only how well they are meeting their objectives, but also how well they are progressing in their ability to write generalizations.

As you analyze their suggestions you may find they will need help in stating generalizations. In the lesson plan, questions that emphasized the ideas presented were suggested to guide students. In an earlier lesson students were encouraged to give reasons why new facts or ideas were important or interesting. Another suggestion was that sentences begin with "if," "because," or "when." Thus, they were encouraged to make complete sentences in their own words to express the ideas that they had gained.

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