

# Kitchen Math - Levels I & II

## Summary

The use of mathematics as an important component of nutrition management and food preparation.

## Main Core Tie

Food And Nutrition I

[Strand 2](#)

## Additional Core Ties

Food And Nutrition I

[Strand 2 Standard 3](#)

Food And Nutrition II

[Strand 1](#)

Food And Nutrition II

[Strand 1 Standard 2](#)

## Background for Teachers

The knowledge of mathematics is an important part of even the most simple food laboratory experiences.

### BREAD...AN ANCIENT ART

Adapted from information from Pepperidge Farms

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Bread was man's first processed food. It has been used as currency and wages, as an offering to the gods, and as a physical charm to ward off evil spirits. Bread has been used as a badge of wealth and as a symbol of poverty. It has been one of man's most important staples, an essential part of his diet through the ages.

At first, man chewed the cereal grains found growing wild to sustain him between hunting trips. Later, he learned how to grow and harvest the grain and grind it into flour. He added water to this flour to form a sticky paste which could be baked on a flat stone in the sun or over a fire. The resulting bread was hard on the outside, soft on the inside - a product quite different from what we use today.

The flat wafer type of bread was to be used by civilizations through the ages until about 3000 B.C. when an Egyptian baker stumbled onto the discovery of raised or leavened bread. Legend states that a baker prepared some dough and forgot it. The next day, the mixture was found...doubled in size.

The baker was amazed, and frightened too, for he was fearful of losing his job (and his head) for ruining a batch of bread. He placed the puffed up dough in the oven and sat down to await the results. Imagine his delight when the finished loaf was taken out and tasted! It was so delicious and of such different shape and texture that he repeated and perfected his "mistake" of souring dough before baking. A new kind of bread was born and the baker kept his job.

The Egyptians soon discarded the hot stone method of baking bread for clay pot ovens set in hot coals. From this, they designed an oven made of clay or mud adobe that had a partition in the top for the bread and on the bottom for coals.

The Greeks refined this early oven with a beehive design of their own. This retained the heat more effectively. They also developed the first mill in which grain could be ground into flour.

The beehive oven was further perfected by the Romans who enclosed the oven with thick walls and added a chimney. This was known as a peel oven for the long-handled shovel used to place bread in the baking chamber. Versions of this oven are still used in parts of the world today.

Many towns had bake houses or communal ovens that became social centers. The ladies could bring

dough and chat while it was baking.

The Egyptians of course were very good bakers, but it was the Greeks who developed a delicious array of breads...as many as 50 to 75...made with such ingredients as honey, oil, cheese, dates, and fruits.

The Romans had a dessert similar to our French bread. Theirs was dipped in milk and fried. Honey was served atop this treat.

Marco Polo reported that the bread of China was steamed because they had no ovens, producing a product similar to dumplings.

There was little or no bread baking during the Dark Ages when feudal lords forbade the growing of wheat.

Bakers in England started the first trade guild; and, it was in England that the term baker's dozen began. Henry VIII stated that a baker's dozen of rolls must weigh a fixed amount. If it does not, the baker will be beheaded. Small wonder customers were given 13 rolls to the dozen!

The soda bread of Ireland is a tradition, as is boxty a bread made of potatoes, flour, butter, and salt. Koreans boast of the most extraordinary breads made with dates, radishes, sesame oil, bark of pine trees, and leaves of rare plants. The names for these breads are even more unusual: Yellow Rose, Chrysanthemum, or Cockoo bread.

In Mexico, the local bread is a tortilla which, when fried, is known as a tostado. The Swedes love limp, a delicious sweet rye bread. Homemakers in India serve chapati, a flat, crisp cracker the size of a large dinner plate.

In Israel, the popular bread is an egg-rich, braided loaf called challah. The well-known unleavened cracker-like Matzo has its origin in Biblical times.

One of the first breads eaten by early settlers in the United States was corn bread made by a recipe learned from the Indians.

English settlers brought the first wheat to the New World, and soon here, as elsewhere in the world, bread was a basic part of the diet. The grain was carried in almost every wagon heading west.

A popular cookbook of the 19th century admonished homemakers to "knead bread for from 45 minutes to one hour"! Cowboy cooks in the West so prized their starter for sourdough bread, that they would take the starter to bed with them in order to keep it warm and usable.

By 1640, commercial bakeries were operating in America. Today, most of the bread we enjoy is made by bakers and not in the home. It is a precision product, expertly weighed and handled throughout preparation. Science has improved the ancient art of bread making; we now have the best versions ever available of man's basic food. Enriched loaves, produced under rigid quality control and in vast variety...this is the bread of today.

#### **BREAD BOX TIPS**

Keep bread and bread products in a bread box or cupboard area that's dry and cool. Wash this storage area with a solution of water and vinegar to retard mold.

Rewrap bread after use and seal in its own bag or wrapper.

Storing bread in the refrigerator will accelerate staling, though retard mold growth. Heating or toasting will restore freshness of refrigerated bread. It is best to freeze bread for storing for prolonged periods of time.

#### **THE SANDWICH BOARD**

The delicious snack or meal we know as a sandwich received its name from John Montague, Fourth Earl of Sandwich, England. This swashbuckling statesman was a notorious gambler and card player. Legend states that he became so engrossed in a card game one evening, he refused to stop for dinner. To satisfy his hunger and his desire to stay at the card table, he ordered his meat put between two slices of bread so that he could eat it neatly from the hand. Just imagine how many sandwiches have been eaten since that first one was invented!

#### **SUGGESTIONS FOR BETTER AND TASTIER SANDWICHES**

Bread for sandwiches should be fine, even-texture and at least twenty-four hours old. Although white bread is very often used, other kinds of bread make palatable sandwiches. Raisin bread, nut bread, steamed brown bread, rye bread, and toasted bread give pleasing variations. Choose from a variety of breads and rolls for sandwich creations.

Choose thin, even slices of bread.

To prevent soggy sandwiches, spread bread first with softened butter or margarine. This will form a seal between bread and filling. Spread it with filling in such a way that the edges will match when the slices are laid together.

Do not trim the crust from the bread (unless you are making petite party canapes); it will stay fresh longer.

If preparing sandwiches in advance of a party, wrap well with foil or plastic wrap and refrigerate. For dainty sandwiches remove the crust and cut the sandwiches into any desired shape. Cookie cutters can be used to cut thin slices of bread.

Extra moist filling, tomato slices and condiments, should be wrapped separately and added at serving time when sandwiches are to be carried in a lunch box. All sandwiches containing green vegetables should be put together just before serving.

Use very fresh bread for sandwich roll ups. Press bread flat with a rolling pin so bread won't crack or break.

Sandwiches may be kept from drying out by wrapping them in plastic wrap.

NOTE TO TEACHER: This is a good way to encourage students to taste new food combinations.

#### SUGGESTIONS FOR SANDWICH FILLINGS

Good butter without other filling.

Butter creamed with minced parsley or water cress.

Butter mixed with strained honey.

Jelly, jam, or marmalade.

Sliced cold meat.

Minced meat with salad dressing or seasoning.

Bacon with lettuce and salad dressing.

Lettuce with mayonnaise.

Lettuce with sliced cucumbers and salad dressing.

Lettuce with hard-cooked eggs and salad dressing.

Sliced onions with French dressing.

Cottage cheese with thin slices of tomato.

Cottage cheese mixed with apple butter.

Cottage cheese and finely minced parsley.

Thin slices of cheese.

Cream cheese with nuts.

Pimentos or chopped olives.

Chopped nuts with cooked salad dressing.

Peanut butter with white or brown bread.

Scraped beef, seasoned.

Sliced pineapple.

Chopped prunes and figs.

Chopped raisins and nuts with a few drops of lemon juice.

Sardines with hard-cooked eggs.

Chicken liver with sliced tomato.

Bacon with egg.

Peanut butter mixed with salad dressing.

Marmalade in bread, toasted.

Cheese in bread, toasted.

(Let students brainstorm other suggestions - try to make it something different to try.)

## MAKING OF SANDWICHES

The best bread for sandwiches must be fresh enough to be palatable, but not so fresh that it tears when spread (except for rolled sandwiches, which require very fresh bread). For thin, dainty sandwiches, buy bread unsliced and cut it just before making the sandwiches with a razor-sharp knife. The knife will need frequent sharpening if you have many sandwiches to make. Bread for dainty sandwiches should never be sliced more than  $\frac{3}{8}$  inch thick. Sliced bread is usually at least  $\frac{1}{2}$  inch thick, sometimes a little more, and a sandwich of these proportions is quite a mouthful; good for lunch boxes but not for special occasions.

NOTE TO TEACHER: Store bakeries will slice bread horizontally if given advanced notice (for rolled, checker board, and layered sandwiches).

An uncut loaf may be sliced either crosswise for regular sandwiches, or lengthwise for rolled sandwiches or a sandwich loaf, but in either case, it is important to slice it evenly. The crust can be cut from the loaf before slicing the bread if preferred, but though it means a little more work and also a little more waste, it is generally more satisfactory to trim the crusts off after the sandwich is made. It is easier to spread the bread before trimming and the sandwich will look neater with the filling that goes right to the edge of the bread, if trimming is done after applying the filling. Of course, each slice of bread must be buttered on the side next to the filling.

Apply the filling generously, especially if it is mild flavored. The thickness should vary according to the thickness of the bread; slices  $\frac{5}{8}$  inch thick will require more filling to be tasty than slices  $\frac{3}{8}$  inches thick.

If sandwiches are to be kept a while or carried in a lunch box, they should be wrapped in plastic wrap or waxed paper as soon as they are made. If different fillings are used, each sandwich should be wrapped separately to prevent an interchange of flavors. Ribbon and checkerboard sandwiches, and others which need to be chilled or even frozen for a time, should always be snugly wrapped in plastic wrap before storing in the refrigerator. It not only preserves flavor but prevents drying out.

## SERVING OF SANDWICHES

REGULAR SANDWICHES for family luncheons or lunch boxes present no particular problem of serving beyond that of making them as attractive and easy to eat as possible. This is done by cutting the whole sandwich neatly into halves or quarters so it can be handled conveniently. But if everyone is hungry and the sandwiches are good, no one will worry about a fancy arrangement.

PARTY SANDWICHES --finger, ribbon, rolled, checkerboard, mosaic -- lend themselves to arrangement. Flat trays, platter and large chop plates are ideal. Sandwiches of the same kind should be grouped together in platoons in the company area. Several kinds may be put on the same plate, but may be separated by sprigs of parsley, olives, or small pickles, which make an edible garnish. Such a tray of carefully made sandwiches is appealing to the eye.

## MATH IN FOOD PREPARATION

Math is an important skill in following/changing a recipe. Math plays an important part in recipes especially when it comes to meal planning. Examples: recipes made for 4 servings can be changed to make 10 serving by multiplying; recipes made for 4 people can be changed to serve 2 people by dividing.

Math is used in many ways in preparing food. Sandwich preparation is one medium that can be used to illustrate the use of math. Math should be emphasized throughout all of food preparation activities.

## Instructional Procedures

### ACTIVITIES:

The teacher will demonstrate sandwich making while discussing information regarding sandwiches. Ask students what they think, for example,  $\frac{3}{8}$  thickness looks like. Teaspoon,

tablespoon and cup equivalents can be compared. Designs (there are many), using fractions, can be created. Let the students become involved with fractions.

Have students read about sandwiches, and brainstorm and discuss the [ANATOMY OF A SANDWICH](#). Use a transparency as a vehicle for discussion. The transparency could be colored as the discussion takes place.

Students will prepare sandwiches in the lab using [SANDWICH RECIPES](#) and display their accomplishments. Each unit can be assigned a different kind of sandwich to make.

Students will complete the worksheet [FRACTION PRE-ASSESSMENT](#). Debrief in class.

NOTE TO TEACHER: Add whatever problems you wish to the worksheet. Demonstrate by cutting sandwiches into fractions.

Students will complete [WHAT DO I DO IF...? - CASE STUDIES](#) worksheet. Challenge them to come up with a list of ways math is used in foods. Give a prize to the foods class with the largest list.

Use sandwiches as a roulette or as bell ringer activity.. Make and wrap sandwiches. Number each one. Have students draw a number from a hat and hold the number. Teacher then draws a number from a like set of numbers on index cards with a different fraction on each index card. Students must cut and divide or put back together sandwich pieces to make the fraction listed on the card drawn. Task must be completed before the bell rings (use a stop watch or let a student act as a time keeper).

Variation:

Use a party loaf instead of sandwiches.

Adjust a party loaf or sandwich recipe so that when cut, each student in the lab has a piece.

Evaluate students' knowledge of bread and sandwich making using the worksheet [SANDWICHES, SANDWICHES, SANDWICHES!](#)

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