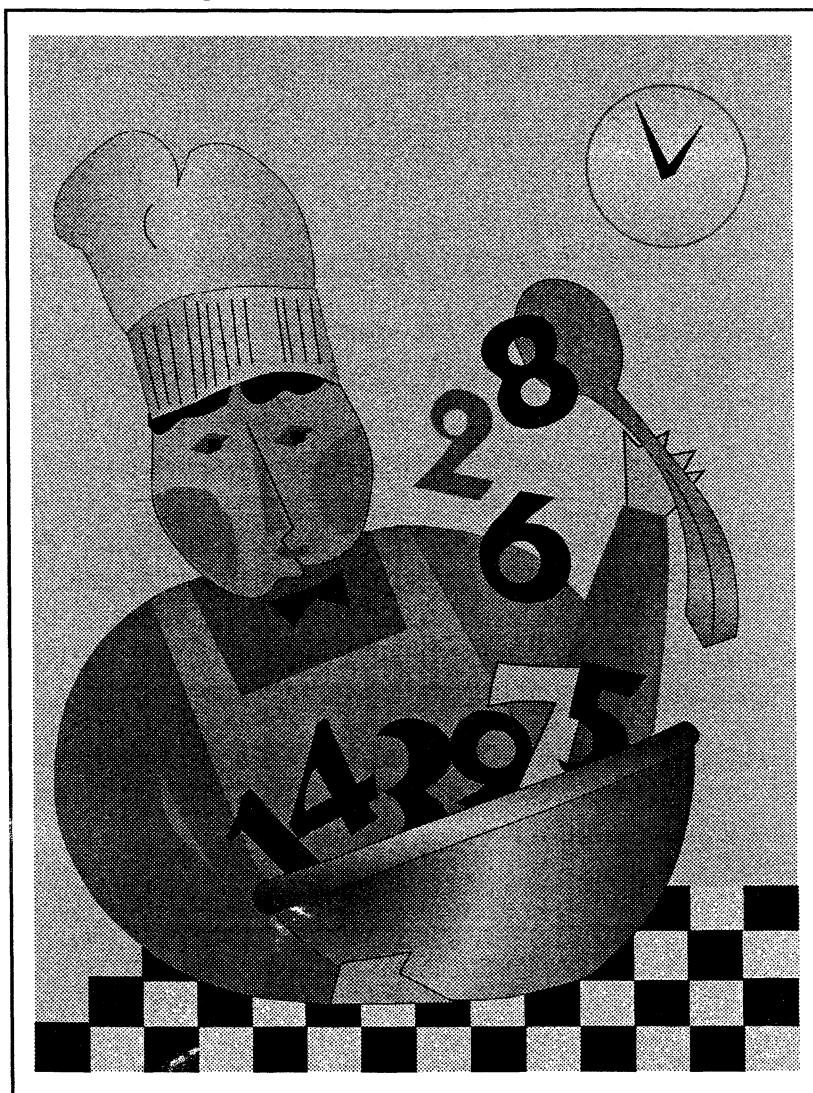



KITCHEN MATH



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Cover illustration by Eileen Stamper

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WALCH
PUBLISHER
PORTLAND, MAINE

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To the Teacher

Objectives

1. To provide students practice in using the basic math operations (addition, subtraction, multiplication, and division) and applying them in real-life situations that involve the selection, purchase, and preparation of foods and the purchase of other kitchen necessities.
2. To help students develop problem-solving skills with an emphasis on knowing when to apply which math operations. (To this end, you may wish to employ the exercises for optional practice using the hand-held calculator.)
3. To provide useful and flexible classroom materials to help teachers develop and evaluate specific math competencies.
4. To make students more aware of some of the practical aspects of shopping, meal planning, and working in the kitchen.

Content

The units in this set include: Planning Ahead, Shopping for Food, Stretching Food Dollars, Using Measurements, Preparation Time, and Kitchen Supplies. A complete list of individual topics appears in the Contents.

Grade Levels

Kitchen Math has been developed for students in middle school through high school, especially those who are having difficulty with math. The set is designed to be useful in any classes at those levels where fundamental math, consumer, and homemaking skills are covered.

The math skills are approximately fourth- to sixth-grade level. The reading level is grade four. The interest level is age twelve to adult.

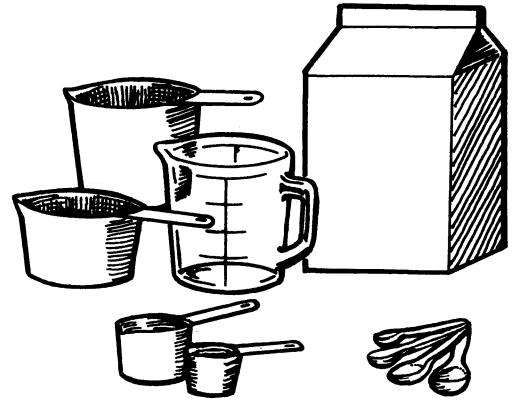
Motivational Aspects

1. Most secondary school students and adults are, to varying degrees, involved with selecting and buying food and working in the kitchen. Students will feel that the content of *Kitchen Math* is relevant to their personal needs.
2. The worksheets are interesting and attractive, an appealing alternative to the standard textbook pages students have seen before.

Equal Measures

Success in cooking begins with correct measuring. To get the best results, keep in mind these basic equivalents.

3 teaspoons	=	1 tablespoon
16 tablespoons	=	1 cup
1 cup	=	8 ounces = $\frac{1}{2}$ pint
2 cups	=	16 ounces = 1 pint
4 cups	=	32 ounces = 1 quart
2 quarts	=	64 ounces = $\frac{1}{2}$ gallon
4 quarts	=	128 ounces = 1 gallon
1 square of chocolate	=	1 ounce
2 tablespoons butter	=	1 ounce
1 stick of butter	=	4 ounces



Directions. Using the chart above, multiply to answer these questions.

1. How many squares would give you 4 ounces of chocolate?

2. Two pints of cream would give you how many ounces?

3. How many teaspoons would give you 3 tablespoons of parsley?

4. How many tablespoons would give you 4 ounces of butter?

5. Three quarts would give you how many cups of soup?

6. Four sticks of butter would give you how many ounces?

7. How many teaspoons of honey would give you 2 tablespoons?

8. How many cups would give you 2 quarts of water?

9. Two gallons of cider would give you how many quarts?

10. Sixteen tablespoons would give you how many ounces of juice?

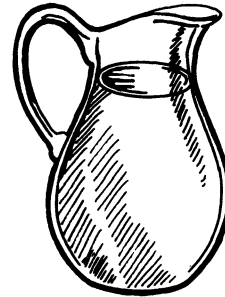


Combining Liquid Ingredients

Serena is making fruit punch. She combines 1000 mL (1 liter) of apple juice, 500 mL of lemonade, and 1000 mL of lime soft drink. How much punch will Serena have?

To find out, add together all the ingredients.

$$\begin{array}{r}
 1000 \text{ mL juice} \\
 500 \text{ mL lemonade} \\
 + 1000 \text{ mL soft drink} \\
 \hline
 2500 \text{ mL (total)}
 \end{array}$$



She will have 2500 mL (or 2.5 liters) of punch.

Part 1. Add to find the total amounts.

- | | |
|-----------------------------|----------------------------|
| 1. 250 mL + 500 mL = _____ | 2. 140 mL + 160 mL = _____ |
| 3. 500 mL + 500 mL = _____ | 4. 250 mL + 700 mL = _____ |
| 5. 500 mL + 1000 mL = _____ | 6. 1.5 L + 2.5 L = _____ |

Part 2. How much will they have in all?

7. Mark combines two bottles of cola. One bottle contains 350 mL and the other contains 1000 mL. What is the total amount of cola? _____
8. In making soup, Patty adds 500 mL of tomato juice and 125 mL of water. How much liquid does she add in all? _____
9. Ellen's recipe includes 250 mL of cream, 750 mL of milk, and 500 mL of water. What is the total amount? _____
10. Tracy mixes 2 liters of ginger ale, 2 liters of lemon drink, and 1.5 liters of cranberry juice. How much liquid will Tracy have in all? _____



Combining Dry Ingredients

Jared mixes $2\frac{1}{2}$ cups of rye flour and $2\frac{1}{2}$ cups of white flour. How many cups will he have in all?



Let's add to find out.

$$\begin{array}{r}
 2\frac{1}{2} \text{ cups} \\
 + 2\frac{1}{2} \text{ cups} \\
 \hline
 4\frac{1}{2} \text{ cups} = 5 \text{ cups in all}
 \end{array}$$

Part 1. Add to find the total amounts.

1.
$$\begin{array}{r}
 2 \text{ cups} \\
 + 1\frac{1}{2} \text{ cups} \\
 \hline
 \end{array}$$

2.
$$\begin{array}{r}
 3 \text{ cups} \\
 + \frac{1}{4} \text{ cup} \\
 \hline
 \end{array}$$

3.
$$\begin{array}{r}
 1\frac{2}{3} \text{ cups} \\
 + 1 \text{ cup} \\
 \hline
 \end{array}$$

4.
$$\begin{array}{r}
 2\frac{1}{2} \text{ cups} \\
 + 2 \text{ cups} \\
 \hline
 \end{array}$$

5.
$$\begin{array}{r}
 \frac{1}{3} \text{ cup} \\
 + \frac{2}{3} \text{ cup} \\
 \hline
 \end{array}$$

6.
$$\begin{array}{r}
 2\frac{1}{4} \text{ cups} \\
 + \frac{1}{2} \text{ cup} \\
 \hline
 \end{array}$$

Part 2. How much will they have in all? You may need another sheet of paper to do the work.

7. Tina uses $\frac{1}{2}$ cup of brown sugar and $\frac{1}{2}$ cup of granulated sugar. How much sugar in all? _____

8. Lan combines $2\frac{1}{2}$ cups of flour and 2 cups of rolled oats. How many cups is that? _____

9. Victor mixes $1\frac{1}{4}$ cups of ziti with $1\frac{1}{4}$ cups of rotini. How many cups in all? _____

10. Senta has $1\frac{3}{4}$ cups of white flour. She adds $\frac{3}{4}$ cup of rye flour. How much flour in all? _____



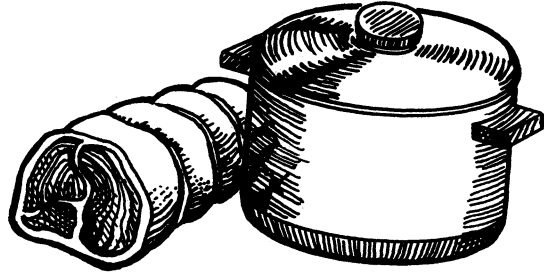
Figuring Leftovers

Betty Ann has 5 pounds of beef. She will use $3\frac{1}{2}$ pounds to make stew. How many pounds of beef will she have left over?

Let's subtract to find out.

$$\begin{array}{r} 5 \\ - 3\frac{1}{2} \\ \hline 1\frac{1}{2} \end{array}$$

5 lb to start
- $3\frac{1}{2}$ lb for stew
1 $\frac{1}{2}$ lb left over



Part 1. Subtract to find out how much is left.

1.
$$\begin{array}{r} 3 \text{ lb} \\ - 2\frac{1}{2} \text{ lb} \\ \hline \end{array}$$

2.
$$\begin{array}{r} 2 \text{ lb} \\ - \frac{1}{4} \text{ lb} \\ \hline \end{array}$$

3.
$$\begin{array}{r} 6 \text{ lb} \\ - 1\frac{1}{2} \text{ lb} \\ \hline \end{array}$$

4.
$$\begin{array}{r} 5 \text{ cups} \\ - 4\frac{1}{2} \text{ cups} \\ \hline \end{array}$$

5.
$$\begin{array}{r} 3\frac{1}{2} \text{ cups} \\ - 2\frac{1}{2} \text{ cups} \\ \hline \end{array}$$

6.
$$\begin{array}{r} 2\frac{1}{2} \text{ cups} \\ - \frac{1}{4} \text{ cup} \\ \hline \end{array}$$

Part 2. How much will they have left? You may need another sheet of paper to do the work.

7. Anita has 3 cups of brown sugar. She uses $\frac{1}{2}$ cup to make peanut butter cookies. How much is left? _____

8. Marlene has a pound of butter. She uses $\frac{1}{4}$ pound to make icing. How much butter is left? _____

9. Andy got $5\frac{1}{2}$ pounds of hamburger. He cooks up $2\frac{1}{2}$ pounds of it. How much is left over? _____

10. Bobbi has $1\frac{1}{4}$ cups of potato salad. She eats $\frac{3}{4}$ cup of it. How much potato salad is left? _____



Adjusting a Recipe

Recipes usually tell you how many servings they will yield. But sometimes you will want to make a different number of servings. When that happens, you must adjust the amount of each ingredient in the recipe. Look at this chart.

HALF RECIPE $\div 2$	To get half as many servings, you make half a recipe. Divide the amount of each ingredient by 2.
DOUBLE RECIPE $\times 2$	To get twice as many servings, you double the recipe. Multiply the amount of each ingredient by 2.

Directions. Here is the list of ingredients from a recipe that serves four people. Fill in the chart to adjust the quantities for making a half recipe and a double recipe.

ITALIAN MEATBALLS to serve 4	HALF RECIPE to serve 2	DOUBLE RECIPE to serve 8
3 slices dry bread	_____	_____
$1\frac{1}{2}$ pounds ground beef	_____	_____
2 eggs	_____	_____
$\frac{1}{2}$ cup grated Romano cheese	_____	_____
1 tablespoon butter	_____	_____
4 tablespoons chopped onion	_____	_____
2 tablespoons chopped parsley	_____	_____
1 clove garlic, minced	_____	_____
$\frac{1}{2}$ teaspoon crushed oregano	_____	_____
$\frac{1}{4}$ teaspoon salt	_____	_____



Ratios in the Kitchen

A ratio is a way of comparing two amounts. In the kitchen, ratios are often used to figure out “before and after” amounts.

Example: One cup of uncooked rice will make 3 cups of cooked rice.

The ratio of uncooked to cooked is 1 to 3.
The fraction $\frac{1}{3}$ names this ratio



Problem: You want to make 6 cups of cooked rice. How many cups of uncooked rice should you use?

Solution: For rice, the ratio of “before” to “after” is $\frac{1}{3}$.

You know you want 6 cups “after.” The equivalent ratio is:



$$\begin{array}{ccccccc} \text{before} & \rightarrow & \frac{1}{3} & = & \frac{?}{6} & \leftarrow & \text{before} \\ \text{after} & \rightarrow & & & & \leftarrow & \text{after} \end{array}$$

Now make the fractions equivalent. To get 6 cups of cooked rice, you need 2 cups of uncooked rice.

$$\frac{1}{3} = \frac{2}{6}$$

Part 1. Make the fractions equivalent.

- | | | |
|--------------------------------------|--------------------------------------|--------------------------------------|
| 1. $\frac{1}{2} = \frac{?}{8}$ _____ | 2. $\frac{3}{4} = \frac{?}{8}$ _____ | 3. $\frac{2}{1} = \frac{?}{3}$ _____ |
| 4. $\frac{1}{5} = \frac{2}{?}$ _____ | 5. $\frac{3}{1} = \frac{9}{?}$ _____ | 6. $\frac{2}{2} = \frac{6}{?}$ _____ |

Part 2. Figure the answers to these before-and-after problems.

7. If you squeeze one orange, you will get 4 ounces of juice. You want to make 32 ounces of juice. How many oranges must you squeeze? _____
8. Four ounces of cheese makes one cup of shredded cheese. You want 3 cups of shredded cheese. How many ounces must you shred? _____
9. Two slices of bread will make a cup of bread crumbs. If you want to make 3 cups of crumbs, how many slices of bread will you need? _____
10. If one pound of dry spaghetti makes 5 cups cooked, how many cups will 2 pounds make? _____

