

Measuring Tips

Some recipes call for sifting ingredients; for example, flour, powdered sugar, and granulated sugar might need to be sifted together. **Sifting** is a process that removes lumps from an ingredient and gives it a smoother consistency. Be sure to sift dry powdery ingredients before measuring them. See Figure 4.18.

Never measure an ingredient while holding the measuring cup over the mixing bowl. Overpour and the entire recipe may be ruined.

If a recipe calls for $\frac{1}{8}$ teaspoon of a dry ingredient but there is no $\frac{1}{8}$ teaspoon measuring spoon, fill the $\frac{1}{4}$ teaspoon measure and level it off. Then, using the tip of a straight-edged spatula or table knife, remove half the ingredient.



Figure 4.18: Sifting removes lumps from ingredients such as flour to give them a smoother consistency.

EP/AP Amounts

Most vegetables have to be trimmed and cut before being used in recipes. As a result, cooks must calculate the correct **edible portion (EP)** amount from the untrimmed **as purchased (AP)** amount. Table 4.10 on the following page indicates the percentage yields for a variety of produce items.

Table 4.10: Percentage Yields of Various Produce Items

Produce Item	Yield
Artichoke, globe	80% (whole, trimmed); 30% (bottoms only)
Artichoke, Jerusalem	80%
Asparagus	55%
Bean, green or wax	88%
Bean, lima	40%
Beet	40–45% (75% purchased without tops)
Broccoli	65–75%
Brussels sprout	80%
Cabbage (white, green, or red)	80%
Carrot	75–80%
Cauliflower	55%
Celery	75%
Celery root (knob celery or celeriac)	75%
Corn (on the cob)	28% (after husking and cutting from cob)
Cucumber (slicing type)	75–95% (depending on peeling)
Eggplant	90% (75% if peeled)
Garlic	88%
Kohlrabi	55%
Leek	50%
Lettuce	75%
Mushroom	90%
Okra	82%
Onion, dry	90%
Onion, green (scallion)	60–70%
Parsley	85%
Parsnip	70–75%
Peas (green and black-eyed)	40%
Peas, edible pod	90%
Pepper, sweet (green or red)	82%
Potatoes, white	80%

continued

Table 4.10: Percentage Yields of Various Produce Items *continued*

Produce Item	Yield
Potatoes, sweet (including yams)	80%
Radish	90%
Spinach and other greens	50–70%
Squash, summer (including zucchini)	90%
Squash, winter	65–85%
Tomato	90% (peeled)
Watercress	90%

To determine how much of an item is needed to yield an AP amount, simply divide the edible portion amount needed by the yield percentage. For example, a recipe for pasta salad calls for 4 pounds of cauliflower. The conversion chart shows that cauliflower has a 55 percent yield. To calculate how much will be needed to prepare 4 pounds of trimmed cauliflower, divide the desired EP amount by the yield percentage:

$$4 \text{ pounds trimmed cauliflower} \div 0.55 = 7.27 \text{ pounds untrimmed}$$

The chef needs to purchase 7.27 pounds of untrimmed cauliflower.

The formula can also be used in reverse. For example, the chef has 10 pounds of untrimmed cauliflower, which has a 55 percent yield:

$$10 \text{ pounds untrimmed cauliflower} \times 0.55 = 5.5 \text{ pounds trimmed cauliflower}$$

In order to determine the AP quantity needed to result in a given EP quantity, it is also important to know the cooking loss for the item. Many quantity cookbooks, purchasing textbooks, and yield books include charts of average cooking loss for common food items. A **conversion chart** is a list of food items showing the expected, or average, shrinkage from AP amount to EP amount. These charts are tools that a manager can use, and they work well in most cases.

However, it is wise to conduct your own tests periodically to get the exact AP amount for your operation. A butcher test is used to measure the amount of shrinkage that occurs during the trimming of a meat product. This trimming includes deboning and removing fat and gristle. A cooking loss test is a way to measure the amount of product shrinkage during the cooking or roasting process. The amount of shrinkage due to trimming and cooking is usually expressed in terms of a percentage.

These tests are particularly important if the product is a high-cost item and if it is sold in high volume at the operation. If these two things are true, then the item can have a major effect on the operation's food cost percentage. So nothing should be left to chance. For example, if prime rib is a house specialty, a conver-

sion chart might not be accurate. There are many variables that determine the amount of shrinkage, such as the length of time the product is cooked and at what temperature.

Products today can frequently be purchased in an “as edible portion,” usually known as a convenience item. This is something that is purchased trimmed and cut, such as precut fries. The price of the item is higher, but prep time and labor cost may ultimately be lower. For example, a manager should weigh the amount of time saved peeling and cutting potatoes for fries versus the cost of buying a product that comes already in that form. Figure 4.19 shows the selection of AP fruits and vegetables and then the EP version with their trim beside each item.

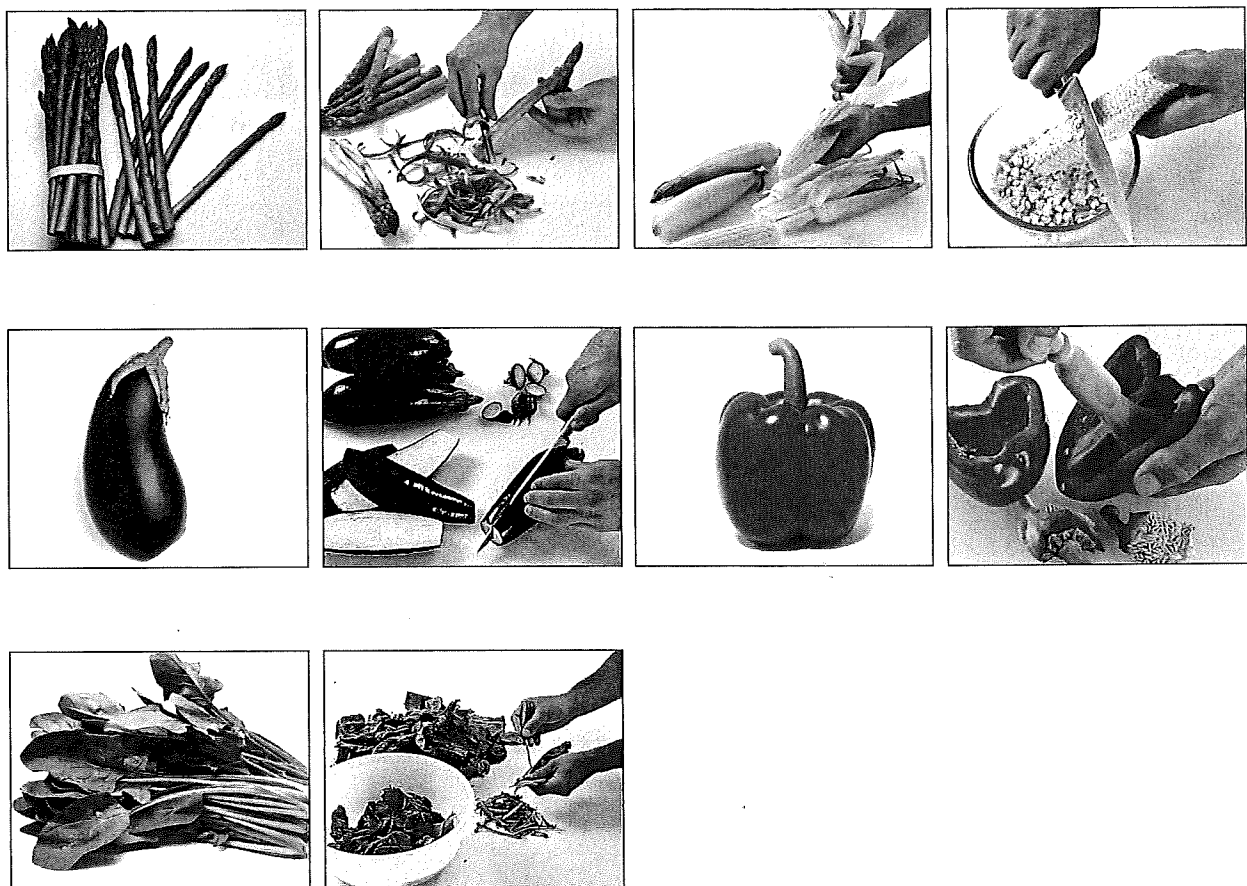


Figure 4.19: An edible portion (EP) is the amount of product that remains after it has been trimmed and cut.

Costing Recipes

Other factors that are essential in quantity food production are standard recipe cost and cost per serving, or standard portion cost. To find the total cost of a standard recipe, a manager must know both the ingredient amounts needed and the market price of each one. Then multiply or divide the ingredient amounts by the prices and add it all up to get the recipe cost. Divide the total cost by the yield to get the standard portion cost. Table 4.11 demonstrates how to calculate a standard recipe cost, using the ingredients for the brownie recipe in Table 4.9.

Table 4.11: Standard Recipe Cost Calculation for the Brownie Recipe in Table 4.9

Ingredient	Amount	Unit Cost
Unsweetened chocolate	1 lb	\$5.50/lb
Butter	1 lb 8 oz	\$2.50/lb
Eggs	1 lb 8 oz	\$5.50/lb
Sugar	3 lb	\$2.50/lb
Vanilla	2 tbsp	\$6.50/lb
Cake flour	1 lb	\$3.50/lb
Baking soda	1 ½ tsp	\$2.75/lb
Chopped walnuts/pecans	1 lb	\$1.49/lb
Ingredient	Amount × Unit Cost	Ingredient Cost
Unsweetened chocolate	1 lb × \$5.50 =	\$5.50
Butter	1.5 lb × \$2.50 =	\$3.75
Eggs	1.5 lb × \$5.50 =	\$8.25
Sugar	3 lb × \$2.50 =	\$7.50
Vanilla	$\$6.50 \div 32 \text{ tbsp} = 0.203 \times 2 \text{ tbsp} =$	\$0.41
Cake flour	1 lb × \$3.50 =	\$3.50
Baking soda	$\$2.75 \div 96 \text{ tsp} = 0.029 \times 1.5 \text{ tsp} =$	\$0.04
Chopped walnuts/pecans	1 lb × \$1.49 =	\$1.49
	Total Cost of Recipe:	\$30.44

Ingredient costs are usually rounded to the nearest cent. Portion costs are ordinarily carried out to **one-tenth** of a cent.

Many operations price out all recipes and then check them every six months to see if they are still accurate. Some establishments compare standard recipe costs to the national price index twice a year. If the index rises or drops a specific percentage, the total recipe cost is raised or lowered by this percentage, and the portion or yield cost is recalculated. While this method simplifies the recalculation process, foodservice operations should really do a complete revision every year.

Sometimes it's necessary to combine portion costs. A steak, for example, may cost \$6.50 served by itself, but the cost increases to \$10.99 when the steak is served with a salad, French fries, a roll, and butter. Some operators calculate the exact cost of each food item and then add the figures together to determine the total cost of a meal. Others simply calculate the average cost of all such extras and add this figure to appropriate items.

When patrons help themselves at a salad bar, there may be an extra calculation necessary to cost out a meal. The usual procedure is to keep an account of the cost of foods in the salad bar and track the number of salad bar patrons served from it. Dividing the number of patrons into the total cost of the salad bar will result in the average cost per serving. This figure can be added to the basic entrée cost. For example, if an operation spends \$95.68 per day to keep its salad bar stocked and an average of 84 guests eat from the salad bar each day, the average cost per serving is:

$$\$95.68 \div 84 = \$1.14 \text{ per serving}$$

Costing can be somewhat complicated. However, the success of a profitable restaurant or foodservice operation depends on balancing costs and prices.

Summary

In this section, you learned the following:

- The basic math calculations using numbers and fractions are addition, subtraction, multiplication, and division.
- A standardized recipe includes details such as the list and amounts of ingredients, yield, equipment, and cooking time and temperature. This information will help to ensure that cooks prepare the recipe the same way each time they make it.

- To increase or decrease recipe yields, do the following:
 1. Decide how many servings are needed or the desired yield.
 2. Determine the conversion factor, the number that each ingredient amount is multiplied by in order to adjust the yield of the recipe.
 3. Multiply each ingredient amount by the conversion factor.
 4. Convert ingredient amounts into logical, measurable quantities.
 5. Make any necessary adjustments to equipment, temperature, and time.
- Customary units include ounces, teaspoons, tablespoons, cups, pints, and gallons. Metric units are based on multiples of 10 and include milligrams, grams, kilograms, milliliters, and liters.
- It isn't necessary to convert between customary and metric measurements if a prep area has the correct measuring equipment.
- To measure temperature, use a thermometer; to measure fat, use the stick, dry measuring cup, or water displacement method; and to measure by weight, use a scale.
- To determine how much of an item is needed (the as purchased or AP amount) to yield an edible portion (EP) amount, divide the EP amount needed by the yield percentage. Get the yield percentage from a conversion table.
- To find the total cost of a standard recipe, a manager must know both the ingredient amounts needed and the market price of each one. Then he or she must multiply or divide the ingredient amounts by the prices.

Section 4.2 Review Questions

- ① Determine the total cost and the cost per serving for the following recipe. The yield is 26 servings.

Chili

<u>Ingredient</u>	<u>Unit Cost</u>
4 lb ground beef	\$3.39/lb
3 lb tomatoes	\$1.69/lb
2 lb onions	\$1.09/lb
1 lb green pepper	\$1.59/lb
4 oz garlic	\$2.59/lb
8 oz tomato paste	\$1.79/pt

- ② Describe the difference between the EP amount of broccoli and the AP amount of broccoli.
- ③ Convert the following recipe ingredients from customary units to metric units of measurements.
- 1 c milk
 - 1 lb butter
 - 1 oz oregano
 - 2 tbsp olive oil
- ④ Convert the following recipe for 12 portions so that it yields 60 portions.

Stir-Fried Chicken

3 lb chicken	6 oz soy sauce	1 lb green peppers
1 ½ lb scallions	2 oz ginger	2 c water

- ⑤ What is the formula for increasing or decreasing recipe yield?
- ⑥ Dr. Jerald Chesser comments that a profession is defined as a calling requiring specialized knowledge. Why does a foodservice manager need to know details such as ingredient amounts and market price?
- ⑦ How would Alex change a recipe that serves 18 into one that serves 150?
- ⑧ How is math used in foodservice operations, both in front of the house and back of the house?
- ⑨ What is the difference between AP and EP and why is it important?

Section 4.2 Activities

1. Study Skills/Group Activity: Recipe Cards

Work with two other students to find three appetizer recipes, each to serve between six and eight people, and each containing at least eight ingredients. Now convert each recipe to serve 20 people. Make a recipe card for each, showing both versions.

2. Activity: Recipe Conversion

Your restaurant will cater an outdoor picnic for 450 people.

- Salad dressing recipe serves 12
- Barbecue sauce recipe serves 50
- Bun recipe serves 120
- Strawberry tart filling recipe serves 24
- Marinated vegetable recipe serves 40

Calculate the conversion factor for each recipe.

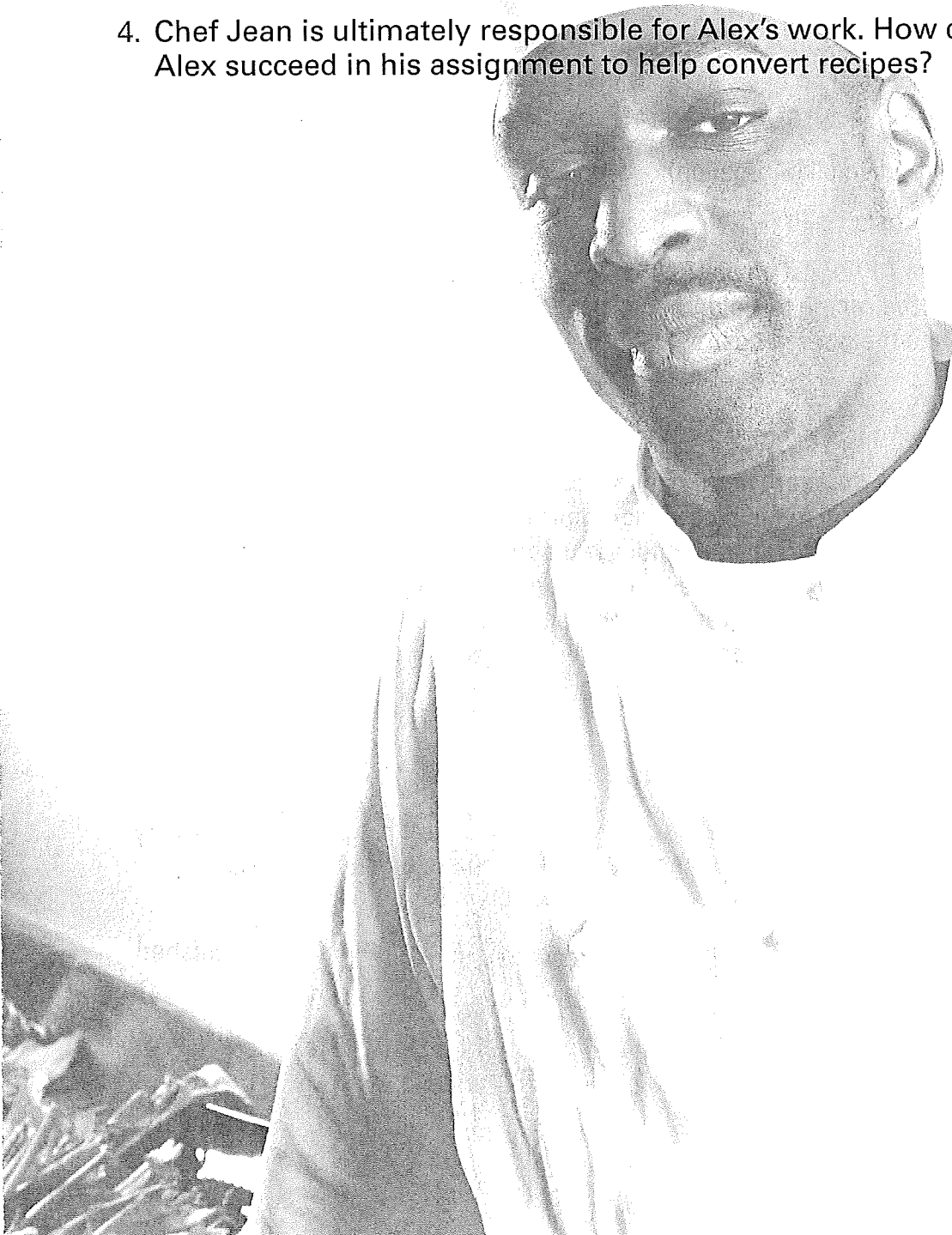
3. Critical Thinking: AP/EP in Action

Select three items from the AP/EP list on pages 245 and 246, and go purchase them. Weigh the AP item, clean and trim it, then weigh the EP item. Do your results correspond to the percentages shown in the chart? Why or why not?

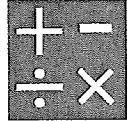
Case Study Follow-Up ***The Art of Professionalism***

At the beginning of the chapter, Chef Jean hired Alex as prep cook.

1. How are Alex's "people skills" relevant to his work as a prep cook?
2. Explain how Alex provides customer service. Who are his customers?
3. How can Chef Jean reinforce the lessons in professionalism he is teaching Alex, other than just telling him how to behave?
4. Chef Jean is ultimately responsible for Alex's work. How can he help Alex succeed in his assignment to help convert recipes?



Apply Your Learning



Calculating Recipe Cost

A ratatouille recipe serves ten. The EP amounts required to make the recipe are:

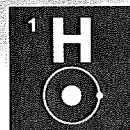
- 2 lb tomatoes (\$0.95/lb)
- 2 lb summer squash (\$0.79/lb)
- 1 lb eggplant (\$1.19/lb)
- 8 oz onion (\$0.25/lb)
- ½ oz garlic (\$0.35/lb)
- 1 fl oz olive oil (\$25/gallon)
- ¼ oz kosher salt (\$1/lb)

Using the AP/EP list on pages 255-256, calculate the recipe cost. Now convert the recipe to yield 25 portions. What is the new recipe cost? Calculate the portion cost.



Culinary Education

Today there are more options for culinary education than ever before. In addition to the time-honored practice of on-the-job training, two other paths are available: attending an accredited culinary school or participating in a formal apprenticeship program. Research both culinary schools and apprenticeship programs. How are they similar and different? What pros and cons do you see for each? Write three paragraphs on your findings.



Volume vs. Weight

Volume and weight are both ways to measure, but they measure very different things. Volume measures the space an object occupies, while weight measures how resistant the object is to gravity.

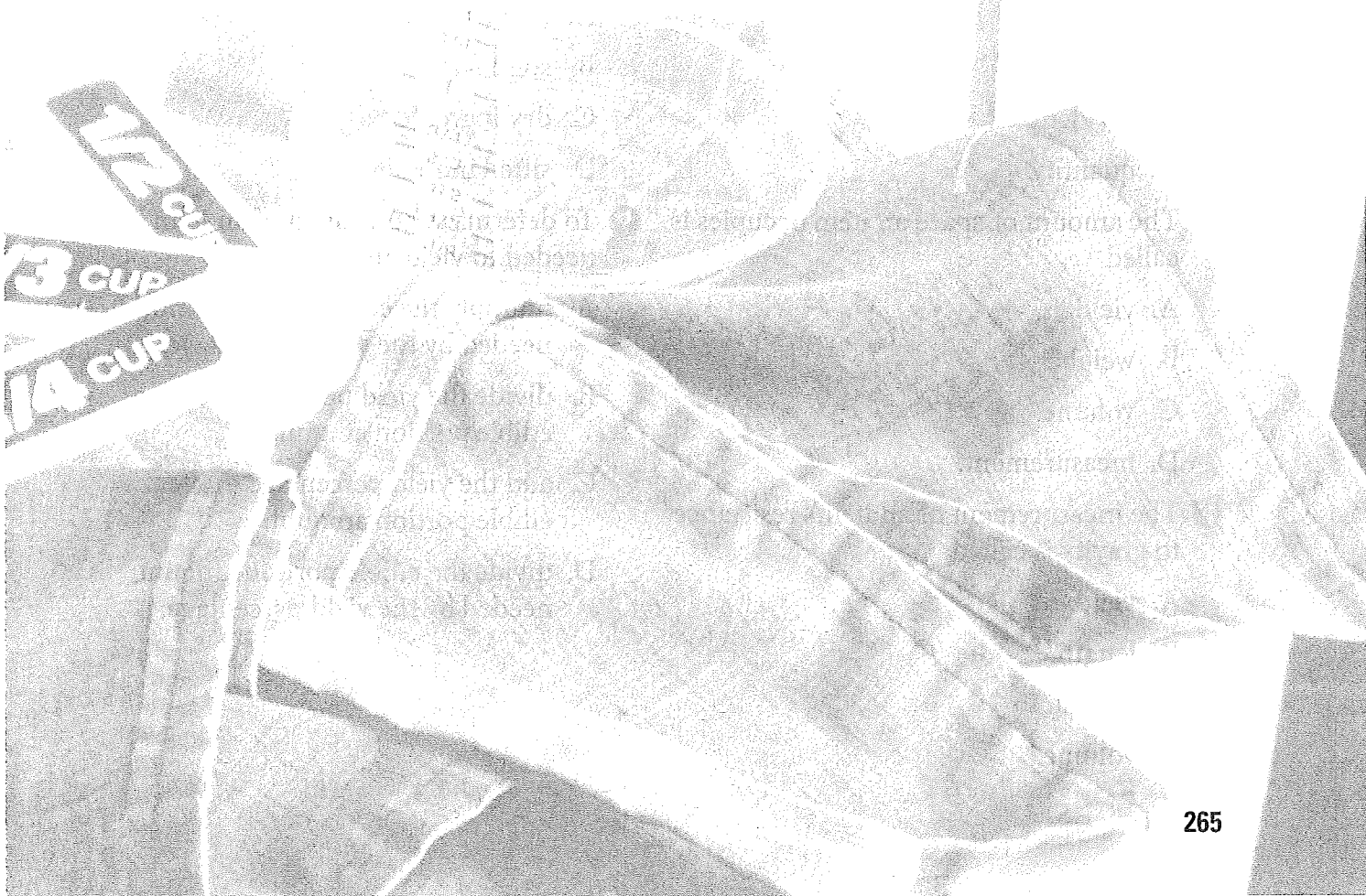
Using the wrong measurement can have a significant effect on the finished product.

Collect a dry cup measure and a liquid cup measure, plus a precise scale. Measure out the volume given for each ingredient below, then weigh it. Be sure to tare the scale first! Compare the weights for each item. What did you learn? Write two paragraphs on your findings.

- 1 c water
- 1 c heavy cream
- 1 c vegetable oil
- 1 c simple syrup (1:1 water : sugar)
- 1 c all-purpose flour
- 1 c granulated sugar
- 1 c dark brown sugar
- 1 c kosher salt

Critical Thinking The Importance of Professionalism

Professionalism means many things, as you have learned. What do you personally think is the most important part of being a culinary professional and why? Prepare a brief oral report on your selection.



Exam Prep Questions

- ① If you use 1 pound of mirepoix in a recipe that yields 1 gallon of soup, how much mirepoix do you need to make $3\frac{1}{2}$ gallons of soup?
 - A. $2\frac{3}{4}$ pounds
 - B. 3 pounds
 - C. $3\frac{1}{2}$ pounds
 - D. 4 pounds
- ② At what temperature does water boil?
 - A. 32°F
 - B. 100°F
 - C. 172°F
 - D. 212°F
- ③ The number of servings a recipe makes is called the
 - A. yield.
 - B. portion.
 - C. dividend.
 - D. quantity.
- ④ The amount of space an item occupies is called
 - A. yield.
 - B. weight.
 - C. volume.
 - D. measurement.
- ⑤ The measurement of an item's resistance to gravity is called
 - A. yield.
 - B. length.
 - C. weight.
 - D. volume.
- ⑥ How many ounces does 1 cup of water weigh?
 - A. 4
 - B. 6
 - C. 8
 - D. 10
- ⑦ The process that removes lumps from a dry, powdered ingredient and gives it a smoother consistency is called
 - A. sifting.
 - B. mixing.
 - C. blending.
 - D. flattening.
- ⑧ The stick and water displacement methods are used to measure
 - A. liquids.
 - B. solid fats.
 - C. dry ingredients.
 - D. sifted ingredients.
- ⑨ To determine how much of an item is needed to yield an AP amount,
 - A. multiply the edible portion amount needed by the yield percentage.
 - B. divide the yield percentage by the edible portion amount.
 - C. add the yield percentage to the edible portion amount.
 - D. divide the edible portion amount needed by the yield percentage.

- 10 Fractions can be added once they have a
- A. decimal.
 - B. dividend.
 - C. common numerator.
 - D. common denominator.