

Cakes, Cookies, Pies, and Candies

Career Path

Ask students what kinds of skills people working as cake decorators, pastry chefs, and candy makers might need.

Vocabulary Builder

Have students look in the index of a cookbook to see which of the *Terms to Know* they can find listed.

Cake Decorator

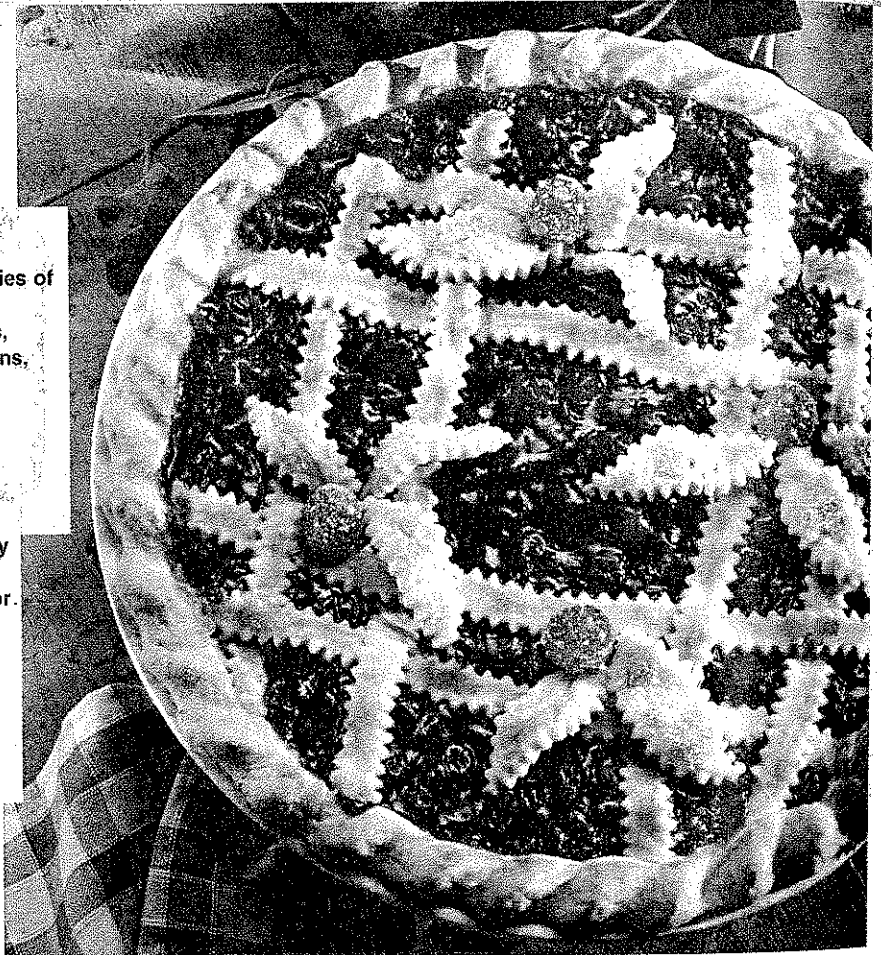
Decorates cakes and pastries with designs using icing bag or handmade paper cone.

Pastry Chef

Supervises and coordinates activities of cooks engaged in preparing desserts, pastries, confections, and ice cream.

Candy Maker

Mixes and cooks candy ingredients by following, modifying, or formulating recipes to produce product of specified flavor, texture, and color.



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Terms to Know

shortened cake
unshortened cake
chiffon cake
pastry

crystalline candy
noncrystalline candy
sugar syrup

Objectives

- After studying this chapter, you will be able to
- describe the functions of basic ingredients used in cakes.
 - identify six types of cookies.
 - explain principles of pastry preparation.
 - compare characteristics of crystalline and noncrystalline candies.
 - prepare cakes, cookies, pies, and candies.

Meeting Special Needs

Challenge academically gifted students in your class to attain the following higher-order objectives as they study the chapter:

- analyze the functions of basic ingredients used in cakes.
- differentiate among the six types of cookies.
- apply principles of pastry preparation when making a basic piecrust.
- demonstrate how characteristics of crystalline candies differ from those of noncrystalline candies.
- evaluate the flavor, texture, and appearance of prepared cakes, cookies, pies, and candies.

For many people, a meal is not complete without something sweet. Restaurants are famous for the richness of their cheesecakes. Bakeries pride themselves on their pastries. Candy stores guard their recipes for fudge, peanut brittle, and English toffee.

Cakes, cookies, and pies are three of the most popular desserts. Candies are not really desserts, but because they are sweet, many people serve them at the end of a meal.

Most desserts are high in calories because they contain large amounts of sugar and fat. Desserts should never replace grain foods, fruits, vegetables, dairy products, or protein foods in the diet. However, they can add variety to meals and provide extra energy for people who are active.

Cakes

Cakes are a favorite dessert of many people. They add festivity to many special occasions. They also add variety to lunch boxes and make a plain meal something special.

Q: Doesn't eating too much sugar make children hyperactive?

A: Research has not proven this to be true. Children often seem excited after eating sweets at a party. However, they are more likely responding to the active games and party atmosphere than the sweets.

Kinds of Cakes

Cakes are classified into two groups: shortened and unshortened. **Shortened cakes** contain fat. This is why some people call shortened cakes *butter cakes*. Most shortened cakes contain leavening agents. Shortened cakes are tender, moist, and velvety.

Unshortened cakes, sometimes called *foam cakes*, contain no fat. They are leavened

by air and steam rather than chemical leavening agents. Angel food and sponge cakes are unshortened cakes. The main difference between these two cakes is the egg content. Angel food cakes contain just egg whites. Sponge cakes contain whole eggs. Unshortened cakes are light and fluffy. See 24-1.

Chiffon cakes are a cross between shortened and unshortened cakes. They contain fat like shortened cakes and beaten egg whites like unshortened cakes. They have large volumes, but they are not as light as unshortened cakes.

Cake Ingredients

Cakes contain flour, sugar, eggs, liquid, and salt. All shortened cakes also contain fat, and most cakes contain a leavening agent. Unshortened cakes contain cream of tartar, too.

Flour gives structure to a cake. The gluten that develops when flour is moistened and

Reflect

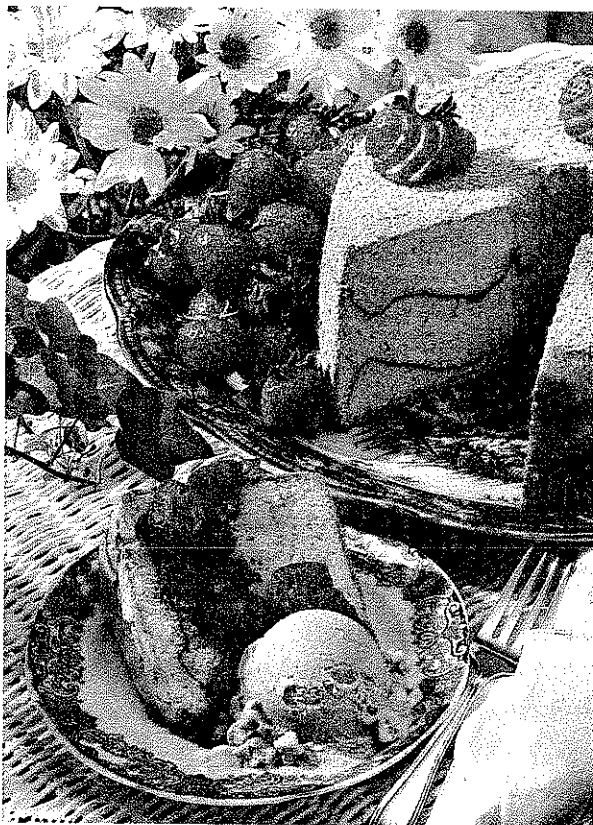
Ask students what their favorite flavor of birthday cake was when they were children. How were their favorite cakes decorated?

Vocabulary Builder

Have students compare the terms *shortened cake*, *unshortened cake*, and *chiffon cake*.

Integrating Math Concepts

Using the kind of flour a recipe recommends is best. However, you can substitute all-purpose flour for cake flour, if necessary. For each 1 cup (250 mL) of cake flour, use 1 cup minus 2 tablespoons (220 mL) of all-purpose flour. Ask students to figure how much all-purpose flour they should substitute in a recipe calling for $2\frac{1}{2}$ cups of cake flour. (2 cups plus 3 tablespoons)



Wilton Industries

24-1 Angel food cake is leavened by air beaten into egg whites.

Interdisciplinary Connections

Team up with the business department to help students plan an entrepreneurship experience. Have students choose a cake, cookie, pie, or candy recipe they think will sell well to other students in your school. You can help students use ingredient prices to determine the unit cost of their product. The business teachers can help students identify other business expenses, determine an appropriate profit margin to price the product, and prepare a marketing strategy. You can supervise product production and the business teachers can oversee the sales operation.

Resources

- *Kinds of Cakes*, Activity A, SAG. Students are to complete exercises about cakes.
- *Minimum Ingredient Proportions in Baked Goods*, reproducible master 24-1, TR. Go over the handout with students. Explain how students can use it to reduce fat, sugar, and sodium in foods prepared from traditional recipes. Encourage students to post the handout in their kitchen at home for future reference.

Integrating Math Concepts

Have students adjust the ingredient proportions of a traditional cake recipe according to the guidelines given in Chart 24-2.

mixed holds the leavening gases that form as cakes bake. You can make cakes with cake flour or all-purpose flour. Cakes made with cake flour are more delicate and tender. This is because cake flour has lower protein content, so it yields less gluten. It is also more finely ground than all-purpose flour.

Sugar gives sweetness to cakes. It also tenderizes the gluten and improves the texture of cakes. Recipes may call for either granulated or brown sugar. Both should be free of lumps.

Eggs improve both the flavor and color of cakes: The coagulated egg proteins also add structure to cakes. In angel food and sponge cakes, eggs are important for leavening. Eggs hold the air that is beaten into them, and the evaporation of liquid from the egg whites creates steam.

Liquid provides moisture and helps blend ingredients. Most cake recipes call for fluid fresh milk. However, some call for buttermilk, sour milk, fruit juices, or water instead. In angel food cakes, egg whites are the only source of liquid needed.

Salt provides flavoring. Cakes require a smaller amount of salt than quick breads and yeast breads.

Fat tenderizes the gluten. Shortened cakes may contain butter, margarine, or hydrogenated vegetable shortening. Chiffon cakes contain oil instead.

Leavening agents are added to most shortened cakes to make the cakes rise and become porous and light. Most recipes call for baking powder or baking soda and sour milk.

Angel food and sponge cake recipes call for *cream of tartar*. Cream of tartar is an acid that makes egg whites whiter and makes the cake grain finer. Cream of tartar also stabilizes the egg white proteins, which increases the volume of the baked cake.

Flavorings are not essential ingredients in cakes, but they help make cakes special. You can add spices, extracts (concentrated flavors), fruits, nuts, poppy seeds, and coconut to cake batters for variety.

Like bread recipes, many dessert recipes call for more of some ingredients than are needed to perform their specific functions. Table 24-2 shows minimum proportions of fat, eggs, sugar, salt, and baking powder for some desserts. Try using these proportions to adjust cake, cookie, and pastry recipes. Your results will be products that are lower in fat, sugar, and sodium.

Food Science Principles of Preparing Cakes

Successfully preparing a cake depends on measuring, mixing, and baking. You must measure ingredients accurately and mix them correctly. You must bake the cake batter in the correct pans at the correct temperature. You also need to watch baking time carefully.

Measuring Ingredients

Flour, fat, sugar, liquid, and eggs affect the development of gluten. The correct proportions of each ingredient will produce a cake that is light and tender. Too much or too little of one or more ingredients may affect the finished product.

The optimum amount of flour provides the correct amount of gluten needed for structure. A cake made with too much flour is compact and dry. A cake made with too little flour is coarse, and it may fall.

Optimum amounts of fat and sugar tenderize gluten. Too much fat or sugar overtenderizes the gluten and weakens it. A cake made with too much of either ingredient will be heavy

Minimum Dessert Recipe Proportions per 1 Cup (250 mL) of Flour					
Product	Fat	Eggs	Sugar	Salt	Baking Powder
Shortened cakes and dropped cookies	2 tablespoons (30 mL)	1/2	1/2 cup (125 mL)	1/8 teaspoon (0.5 mL)	1 teaspoon (5 mL)
Pastry	1/4 cup (50 mL)	—	—	1/2 teaspoon (2 mL)	—

24-2 Using these proportions can help you cut the calories, fat, and sodium from some dessert recipes.

Interdisciplinary Connections

Teach this unit in conjunction with a unit on slavery taught by the history department. Your focus will be on sugar as a key ingredient in cakes, cookies, pies, and candies. History teachers will address the role the European demand for sugar played in increasing the slave trade from the 1500s to the 1800s.

and coarse, and it may fall. A cake made with too little of either ingredient will be tough.

The optimum amount of liquid provides the moisture needed for gluten to develop. Too much liquid will make a cake soggy and heavy. Too little liquid will make a cake dry and heavy.

The optimum number of eggs contributes proteins that strengthen the gluten framework. Too many eggs will make a cake rubbery and tough.

Mixing Cakes

You must mix the correct proportions of ingredients according to the method your recipe directs. Cake batters should be neither overmixed nor undermixed. Overmixing will cause the gluten to overdevelop. As a result, the cake will be tough. Overmixing angel food and sponge cakes will cause air to be lost from the beaten egg whites. As a result, the volume of the cake will be smaller.

Baking Cakes

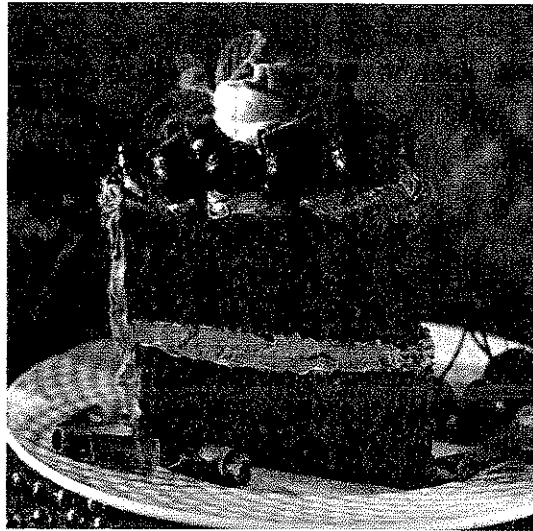
Bake cake batter in pans that are neither too large nor too small. If the pans are too small, the batter will overflow. If the pans are too large, the cake will be too flat and may be dry. The correct pan size will produce a cake with a gently rounded top.

You should grease the pans for most shortened cakes and flour them lightly. You may grease and flour both the bottoms and sides of the pans or just the bottoms. You should not grease the pans for unshortened cakes. This is because angel food and sponge cake batters must cling to the sides of the pan during baking.

Place cakes in a preheated oven set at the correct temperature and bake them just until they test done. Cakes baked at too high a temperature may burn. Cakes baked too long may be dry. See 24-3.

Preparing a Shortened Cake

You can mix shortened cakes by the conventional method or the quick mix method. For



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24-3 A cake that is baked at the correct temperature for the right amount of time is light with a velvety interior.

the *conventional method*, cream the fat and sugar together until light and fluffy. Beat the eggs into the creamed fat and sugar. Then add the dry ingredients alternately with the liquid.

The *quick mix method*, also called the *one-bowl method*, takes less time than the conventional method. Measure the dry ingredients into the mixing bowl. Beat the fat and part of the liquid with the dry ingredients. Add the remaining liquid and unbeaten eggs last.

Pour cake batter into prepared pans. Then arrange the pans in the oven so the heat circulates freely around the cake. The pans should not touch each other or any part of the oven. If

they do, hot spots may form, and the cake may bake unevenly.

To test a cake for doneness, lightly touch the center with your fingertip. If the cake springs back, it is baked. You can also insert a toothpick into the center of the cake. If the toothpick comes out clean, the cake is baked.

Most recipes will tell you to let cakes cool in the pans for about 10 minutes after

Be a Clever Consumer

Many consumers who want to cut fat and calories in their diets are buying reduced fat margarines. In order to achieve the reduction in fat and calories, manufacturers replace some of the fat in these products with water. These products may be fine for spreading on toast. However, they cannot perform the function of fat in cooking and baking. Read labels carefully. For best results in cooking and baking, margarines need to contain at least 80 percent oil.

Think Outside the Box

Ask students what other steps they could take to cut fat and calories when baking. Ask students if they have tried lowfat or low-calorie dessert recipes. How did the finished product differ in taste and appearance?

Discuss

Ask students what will happen if they fail to grease and flour the pans when baking a shortened cake. (Removing the cake from the pans will be difficult.)

FYI

- When greasing and flouring pans for chocolate cakes and brownies, shake a little cocoa into the flour. This will prevent white flour deposits from forming on your finished product.
- An 8- or 9-inch two layer cake, a 13 × 9 × 2-inch rectangular cake, and a 10 × 4-inch angel food cake will all serve 12 to 16 people.

Vocabulary Builder

Pound cakes get their name from their ingredients. Original recipes called for a pound of butter, a pound of sugar, and a pound of flour.

FYI

Students can read more about preparing egg white foams in Chapter 18, "Eggs."

Enrich

- Have students use Appendix C to compare the nutritional values of shortened and unshortened cakes. Discuss students' findings in class.

- Have students prepare a packaged mix for a two-layer yellow cake. They should bake one layer in a conventional oven and bake the second layer in a microwave oven, being sure to use a nonmetal cake pan. Have them compare the baking time, appearance, taste, and texture of the two layers.

removing the pans from the oven. This cooling period makes it easier to remove the cakes from the pans. To remove a cake from the pan, run the tip of a spatula around the sides of the cake to loosen it. Invert a cooling rack over the top of the pan and gently flip the cooling rack and the pan. The cake should slide out of the pan. Carefully remove the pan and place a second cooling rack on top of the cake. Flip the cake and the cooling racks so the cake is right side up. Let cake layers cool thoroughly before frosting them.

Characteristics of a Shortened Cake

A high-quality shortened cake is velvety and light. The interior has small, fine cells with thin walls. The crusts are thin and evenly browned. The top crust is smooth or slightly pebbly and gently rounded. The flavor is mild and pleasing.

Pound Cakes

Pound cakes are shortened cakes that contain no chemical leavening agents. Pound cakes rely on air and steam for leavening. You must thoroughly cream the fat and sugar when making pound cake. Beat the eggs into the creamed mixture until fluffy to incorporate enough air. Add the dry ingredients and the liquid to the creamed mixture. Pound cakes are more compact than other shortened cakes, and they have a closer grain, 24-4.

Preparing an Unshortened Cake

Angel food cake is the most frequently prepared unshortened cake. When preparing an angel food cake, the ingredients should be at room temperature. Egg whites that are cold will not achieve maximum volume when beaten.

Angel food and sponge cakes are mixed by a different method from those used for shortened cakes. For an angel food cake, beat the egg whites with some of the sugar until stiff. Carefully fold the flour and remaining sugar into the beaten egg whites. For a sponge cake, beat the dry ingredients into the egg yolks. Then fold the beaten egg whites into the egg yolk mixture.

Carefully pour the batter for an unshortened cake into an ungreased tube pan. Run a spatula through the batter to release large air bubbles and seal the batter against the sides of the pan. Bake the cake in a preheated oven for the recommended time. Test the cake for doneness by

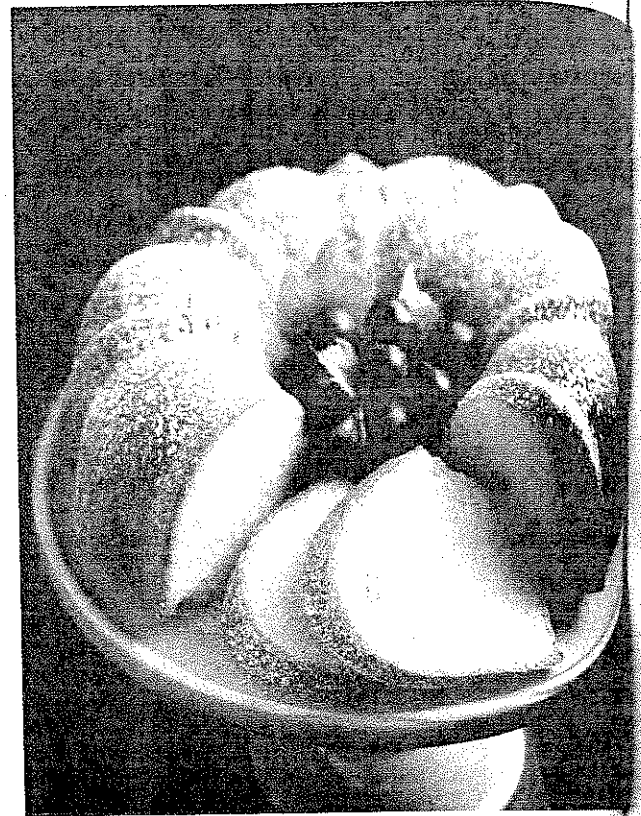


photo courtesy of Land O'Lakes, Inc.

24-4 Pound cake is so moist and rich, it needs no frosting.

gently touching the cracks. They should feel dry and no imprint should remain.

When you remove an unshortened cake from the oven, immediately suspend the pan upside down over the neck of a bottle. Hanging the cake upside down prevents a loss of volume during cooling. Cool the cake completely before removing it from the pan.

Characteristics of an Unshortened Cake

A high-quality angel food cake has a large volume. The interior is spongy and porous and has thin cell walls. The cake is tender and moist, but it is not gummy.

Sponge Cakes

Sponge cakes contain whole eggs rather than just egg whites. To make a sponge cake, you will use a variation of the mixing method used for angel food cakes. Beat the egg yolks until they are thick and lemon colored. Add the liquid, sugar, and salt to the yolks. Continue

Community Interactions

Have students survey owners and managers of local bakeries and grocery store bake shops to find out what cakes, cookies, and pies are most popular among consumers in your community. Have students share their findings in class.

beating until the mixture is thick. Gently fold the flour into the yolk mixture. Then fold the stiffly beaten egg whites into the flour-yolk mixture.

Preparing a Chiffon Cake

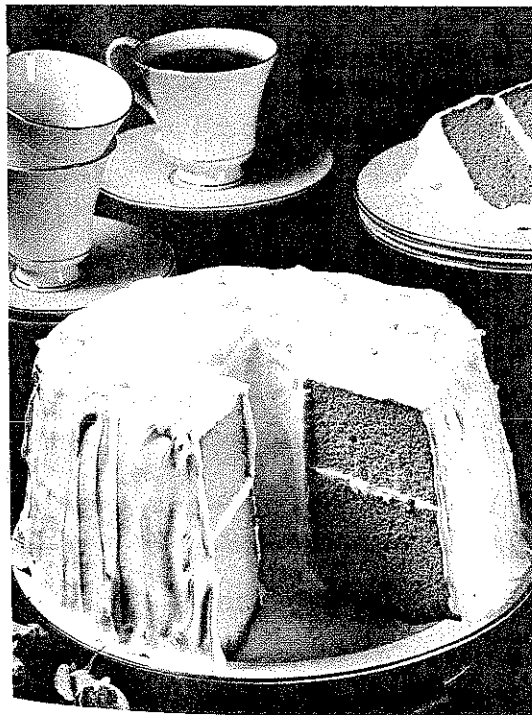
Mix a chiffon cake by combining the egg yolks, oil, liquid, and flavoring with the dry ingredients. Beat the mixture until smooth. Beat the egg whites with the sugar and cream of tartar. Then fold the egg white mixture into the other mixture.

Characteristics of a Chiffon Cake

A high-quality chiffon cake has a large volume, although not quite as large as that of an angel food cake. The interior is moist and has cells with thin walls. The cake is tender and has a pleasing flavor, 24-5.

Microwaving Cakes

Shortened cakes prepared in a microwave oven come out moist and tasty. Unshortened cakes require a long cooking period and do not



American Egg Board

24-5 Chiffon cake has a large volume and a light, but moist texture.

Strengthening Family Ties

Have each student prepare and decorate a cake for a family celebration. Invite students to share family members' comments about the taste and appearance of the cakes.

microwave well. For best results, prepare unshortened cakes and chiffon cakes in a conventional oven.

Microwaved cakes will not have the characteristic browning of conventionally prepared cakes. Lack of browning is less noticeable on chocolate, spice, and other dark cakes. Frosting will hide the lack of browning on white and yellow cakes.

Microwave cakes one layer at a time. Use microwavable round or ring-shaped pans for the most even cooking. Begin cooking at a medium power level. Then rotate the cake and complete the last few minutes of cooking on high power. Test cakes for doneness with a toothpick, as in conventional baking.

Filling and Frosting Cakes

Fillings and frostings can make a simple cake into a really special dessert. Fillings and frostings come in as wide a variety as the cakes they enhance.

Fluffy whipped cream, creamy puddings, and sweet fruits are among the popular fillings for cakes. You can spread fillings between layers of cake or roll them into the center of a jelly roll. You can also spoon them into a cavity dug into the middle of a cake.

Canned frostings and frosting mixes are available, but you can easily make frostings from scratch. Frostings may be cooked or uncooked. Cooked frostings use the principles of candy making. They include ingredients that interfere with the formation of crystals in a heated sugar syrup. Then you beat them until fluffy.

Uncooked frostings are popular for their creamy texture. You can easily make them by beating the ingredients together until they reach a smooth, spreadable consistency. Cream cheese frosting and butter cream are well-liked uncooked frostings.

Frostings not only enhance the flavor of cakes, they also enhance the appearance. You can cut cake layers into pieces and reassemble them to form the shapes of animals and objects. Use frosting as the "glue" to hold the pieces together.

Use decorators' frosting to personalize cakes and trim them with pretty flowers and fancy borders. A few simple tools are all you need. A *decorators' tube* is a cloth, plastic, or paper bag you fill with frosting. A *coupler* holds

Resources

- *Preparing Cakes*, Activity B, SAG. Students are to explain various principles and techniques used in preparing cakes.

- *Cake Recipes*, recipe master 24-2, TR. Have students use the recipe master to plan a cake lab. Have each group choose a different frosting or filling for their cake. Each group should complete a *Market Order Sheet* (TR) and a *Time-Work Schedule* (TR). After preparing, filling and/or frosting, and sampling their cake, have each group complete a *Lab Evaluation Sheet* (TR).

- *Cake Decorating Accessories*, transparency master 24-3, TR. Use the transparency as you explain to students how the various decorating tips and accessories are used to decorate cakes.

Enrich

Invite a professional baker to your class to demonstrate various techniques for filling and frosting cakes.

Break It Down

Have students review the meanings of the terms *shortened cake*, *unshortened cake*, and *chiffon cake*. Have students answer questions 1-8 under *Review What You Have Read*. Have them complete activity 1 under *Build Your Basic Skills* and activity 1 under *Build Your Thinking Skills* at the end of the chapter.

Reflect

Ask students what their favorite kind of cookie is and when their families bake cookies.

Activity

Have students find another example of each type of cookie in a cookbook.

Food Science

Ingredient Proportions in Cookies, food science master 24-4, TR. Have lab groups complete the experiment as directed on the master. Students will be evaluating the effect of fat and sugar proportions on the crispness of dropped cookies.

various plastic or metal *decorating tips* onto the tube. Squeeze the frosting through these tips to create various designs. See 24-6.



Cookies

Children and adults find it hard to resist a cookie jar filled with fresh homemade cookies. People enjoy chocolate chip, peanut butter, oatmeal, and sugar cookies year-round. At holiday time, many families make special cookies like Swedish pepparkakor, Norwegian krumkake, and Scottish shortbread.

Kinds of Cookies

All cookies belong to one of six basic groups: rolled, drop, bar, refrigerator, pressed, or molded. The ingredients used to make different kinds of cookies are similar. However, the doughs differ in consistency, and you shape them differently.

You use stiff dough to make *rolled cookies*. Roll the dough on a pastry cloth or board to a thickness of $\frac{1}{8}$ to $\frac{1}{4}$ inch (3 to 6mm). Cut the cookies from the dough with a cookie cutter and transfer them to a cookie sheet. Cookie cutters are available in many shapes and sizes. Sugar cookies are popular rolled cookies.

You use soft dough to make *drop cookies*. Drop or push the dough from a spoon onto

cookie sheets. Leave about 2 inches (5 cm) of space between cookies. Drop cookies will spread more than rolled cookies. Chocolate chip cookies are popular drop cookies.

You also use soft dough to make *bar cookies*. Spread the dough evenly in a jelly roll pan or square cake pan and bake it. Depending on the thickness of the dough, bar cookies may be chewy or cakelike. You can cut bar cookies into different shapes after baking. Brownies are popular bar cookies.

Refrigerator cookies contain a high proportion of fat. Form the stiff dough into a long roll, about two inches (5 cm) in diameter. Wrap the roll in foil or plastic wrap and refrigerate it until firm. When the dough has hardened, cut it into thin slices. Place the cookies on lightly greased cookie sheets and bake them. Pinwheel cookies are popular refrigerator cookies.

You use very rich, stiff dough to make *pressed cookies*. Pack the dough into a *cookie press*. This utensil has perforated disks through which you push the dough onto cookie sheets. The cookies vary in shape and size, depending on the disk used. Swedish spritz cookies are pressed cookies.

You also use stiff dough to make *molded cookies*. Break off small pieces of dough and shape them with your fingers. Crescents and small balls are popular shapes, 24-7.

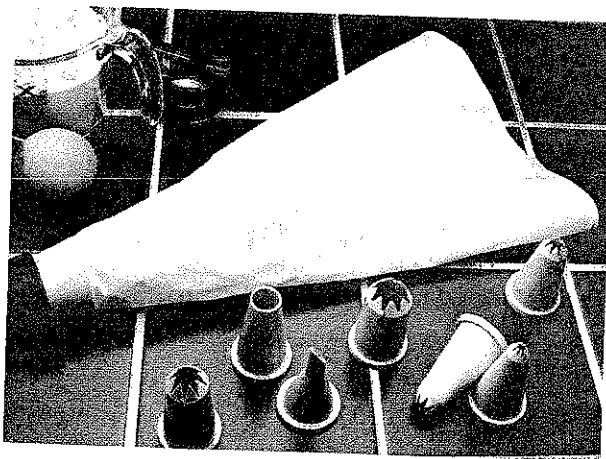
Cookie Ingredients

Cookies contain the same basic ingredients you use to make cakes. They contain flour, sugar, liquid, fat, salt, egg, and leavening agents. Most cookies contain more fat and sugar and less liquid than cakes. Rolled cookies often contain no liquid. The proportion of ingredients, as well as the way you shape the cookies, determines if cookies are soft or crisp.

Many cookie recipes call for ingredients such as spices, nuts, coconut, chocolate chips, and dried fruits. Some recipes tell you to add these ingredients to the dough during mixing. Other recipes say to sprinkle cookies or roll them in colored sugars, coconut, or nuts after baking.

Mixing Methods for Cookies

You will make many cookies using the conventional mixing method you use for shortened cakes. Blend the sugar and fat until smooth. Add the eggs, liquid, and flavorings, followed by

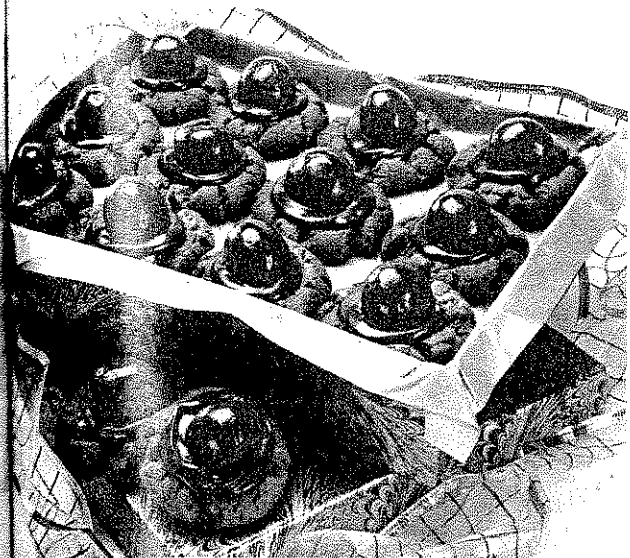


Progressive International Corp.

24-6 These accessories can be used to give any cake a festive trim. They are available at cake and candy supply stores.

Meeting Special Needs

Provide tube squeezers to help students squeeze icing from tubes when decorating cakes and sugar cookies.



Cherry Marketing Institute

24-7 The indentations in these molded thumbprint cookies are filled with chocolate and topped with delicious, colorful cherries.

the dry ingredients. Cookies are crisp or chewy rather than light and delicate. Therefore, you do not need to cream the fat and sugar as thoroughly as you do for a cake. Also, you can add the flour all at once rather than in parts.

Macarons, meringues, and kisses contain beaten egg whites. You mix them like angel food and sponge cakes. You mix a few cookies, like Scottish shortbread, using the biscuit method. (Chapter 23 describes the biscuit method.) Your recipe will tell you which method to use.

Pans for Baking Cookies

Bake drop, rolled, refrigerator, pressed, and molded cookies on flat baking pans or cookie sheets. Cookie sheets should not have high sides, or cookies will bake unevenly. Bake bar cookies in pans with sides.

Baking pans made of bright, shiny aluminum reflect heat. Cookies baked on bright, shiny cookie sheets will have light, delicate brown crusts.

Dark pans absorb heat. Cookies baked on dark cookie sheets will have dark bottoms. See 24-8.

Cookie sheets should be cool when you place cookies on them for baking. Warm sheets will cause cookies to spread and lose their shape.

If you bake two sheets of cookies at one time, you may have to rotate the pans during baking. This will help the cookies brown evenly. Baking pans should never touch each other or the sides of the oven.

Microwaving Cookies

Most microwave ovens are not large enough to efficiently cook dozens of individual cookies. However, bar cookies work well in a microwave oven because the whole pan cooks at once. If using a square or oblong pan, use foil shields to keep the corners from overcooking. Like cakes, bar cookies are often microwaved on medium power and tested with a toothpick for doneness.

Storing Cookies

Store crisp cookies in a container with a loose-fitting cover. To retain their crispness, crisp cookies need to remain dry. Store soft cookies in a container with a tight-fitting cover. Exposure to the air will dry out soft cookies. (Never store crisp and soft cookies together. The soft cookies will soften the crisp cookies.) You can store bar cookies in their baking pan if you cover them, and if you will be eating them in a short time.

For longer storage, you can freeze cookies. Many cookies freeze well both in dough form and after baking.

To freeze refrigerator cookie dough, wrap the shaped rolls tightly in plastic wrap and then in aluminum foil. Label the package and freeze.

You can shape molded, rolled, and drop cookie doughs into large balls. Then wrap and label them for freezer storage. You will need to thaw the dough before molding, rolling, or dropping it. You can freeze bar cookie dough in the baking pan. You can press dough for pressed cookies or drop dough



Healthy Living

Modifying cake, cookie, and pastry recipes will help these foods fit more easily into a nutritious diet. However, they will still be higher in calories and lower in nutrients than many other food choices. Therefore, you will still need to eat them in moderation.

Think Outside the Box

Ask students what healthful alternatives to cakes, cookies, and pies they might choose for desserts. Have them survey the school to find out if students prefer cakes, cookies, and pies to some of the other more healthful alternatives.

Reflect

Ask students if they would prefer to eat cookies baked on a bright, shiny cookie sheet or on a dark cookie sheet.

Discuss

Ask students what the advantage of freezing unbaked cookie dough would be. (You can prepare cookies quickly because the mixing has already been done.)

Resource

Cookies, Activity C, SAG. Students are to identify the basic group to which each of the types of cookies listed on the worksheet belongs. Then they are to identify whether various statements about cookies are true.

Resource

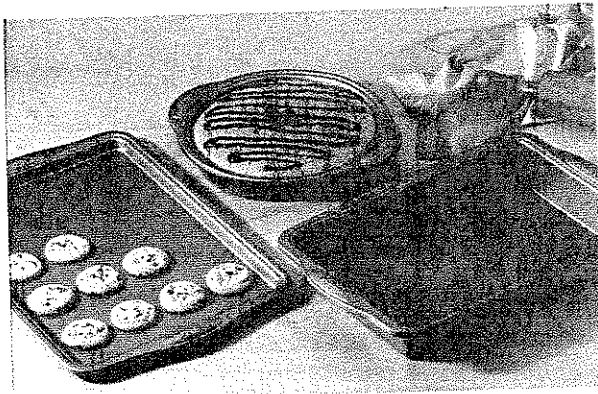
Cookie Recipes, recipe master 24-5, TR. Have students use the recipe master and additional recipes to plan a cookie lab. Additional recipes should be chosen so that at least one example is prepared from each of the six basic groups of cookies. Have each group complete a *Market Order Sheet* (TR) and a *Time-Work Schedule* (TR). Place all the cookies on a sample table. Then have each group complete a *Lab Evaluation Sheet* (TR).

Break it Down

Have students answer questions 9-10 under *Review What You Have Read* and complete activity 2 under *Build Your Basic Skills* at the end of the chapter.

For Example...

Apple, cherry, peach, strawberry, blueberry, and raspberry are among the popular fillings used for fruit pies.



Pyrex

24-8 The dark coating on this cookie sheet will help give the bottoms of these cookies a darker brown crust.

for drop cookies onto cookie sheets and quickly freeze it. You can then remove the frozen dough from the cookie sheet with a spatula. Place the unbaked cookies in airtight containers or plastic bags. Before baking, thaw the cookies at room temperature on a cookie sheet. To freeze baked cookies, pack them in a sturdy container with a tight-fitting cover. Separate layers of cookies with waxed paper or plastic wrap. Cover the container tightly and label.

Freshening Stale Cookies

You can freshen cookies that have lost their characteristic texture. If crisp cookies have become soft or begun to stale, you can make them crisp again. Place cookies on a cookie sheet in a 300°F (150°C) oven for a few minutes. If soft cookies have become hard, you can make them soft again. Place a piece of bread, an apple slice, or an orange section in the cookie container. Replace bread or fruit every other day.

**Pies**

Apple pie is a favorite dessert in the United States. Who can resist the flavor, aroma, and eye appeal of golden flaky pastry filled with warm, spicy apples? Apple pie begins with pastry. **Pastry** is the dough used to make piecrusts. Pastry-making is not difficult. However, it does require practice and patience.

Uses for Pastry

You can use pastry in many ways. You may mainly use it when making dessert pies. However, you can use pastry when making main dish pies, such as meat pies and quiche, 24-9. You can fill small pastry shells with foods such as creamed tuna or chicken a la king to make potpies. You can use small pastry shells to make tarts filled with pudding or ice cream. You can fold pastry squares in half over fruit filling to make turnovers. You also use pastry to make appetizers such as cheese sticks.

Kinds of Pies

The four basic kinds of pies are fruit, cream, custard, and chiffon. *Fruit pies* usually are two crust pies. They may have a solid top crust, or they may have a lattice or other decorative top. You may use commercially prepared pie filling or make filling from canned, frozen, dried, or fresh fruit.

Q: Is there anything wrong with eating some of the dough when I'm making cookies?

A: Most homemade cookie dough contains raw eggs, which can be a source of illness-causing bacteria. If you enjoy eating unbaked cookie dough, choose refrigerated dough that you buy at a grocery store. It is made with eggs that have been pasteurized to kill harmful bacteria. You could also use pasteurized eggs in your homemade cookie recipes.

Cream pies usually are one-crust pies. Use a cornstarch-thickened pudding mixture to make a cream filling. Cream pies often have a meringue topping.

Custard pies are one-crust pies filled with custard made from milk, eggs, and sugar. The custard may or may not contain other ingredients. Pumpkin pie is a popular custard pie.

Online Resource

Have students visit the Sugar Association Web site at sugar.org. Ask each student to research a type of sugar or a basic functional role of sugar in baked products. Have students share their findings in brief oral reports.

Salt contributes flavor to pastry. If you eliminate the salt, it will not affect the pastry in any other way.

Food Science Principles of Preparing Pastry

To make pastry that is both tender and flaky, you must use the correct ingredients. You must measure them accurately. You must also handle the dough gently and as little as possible. See 24-10.

Measuring the Ingredients

Flour, fat, and liquid all affect the tenderness and flakiness of pastry. If you do not measure these ingredients accurately, a poor-quality pastry will result.

Gluten develops when you moisten and stir the flour. The gluten creates a framework that traps air and holds steam formed during baking. This trapped air and steam is what causes pastry to be tender and flaky. Too much flour will make pastry tough.

The fat forms a waterproof coating around the flour particles. This prevents too much water from coming in contact with the proteins of the flour. It also prevents the subsequent development of too

Resources

- *Pie Filling*, Activity D, SAG. Students are to supply requested information about different kinds of pies.
- *Easy as Pie*, color transparency CT-24, TR. Use the transparency as you discuss principles of pastry preparation that will produce tender, flaky pastry.

Enrich

- Have students investigate the difference between all-purpose flour and the pastry flour used by commercial bakeries.
- Have students prepare one piecrust using hydrogenated vegetable shortening and another using oil. After students compare the texture, flavor, and appearance of the two crusts, ask them to explain why they prefer one to the other.



24-10 The texture of pastry is affected by the proportions of the ingredients and the handling of the dough.

24-9 Tender, flaky pastry can be used to make hearty main dishes, such as chicken potpie.

Chiffon pies are light and airy. They are one-crust pies filled with a mixture containing gelatin and cooked beaten egg whites. Some chiffon pie fillings also contain whipped cream. Chill all chiffon pies until the filling sets.

Ingredients for Pastry

You will use four basic ingredients to make pastry—flour, fat, water, and salt. When combined correctly, the four ingredients will produce pastry that is tender and flaky.

Flour gives structure to pastry. Most home bakers use all-purpose flour to make pastry.

Fat makes pastry tender by inhibiting the development of gluten. It contributes to flakiness by separating the layers of gluten. Most bakers use lard or hydrogenated vegetable shortening. These fats produce tender and flaky pastry. Some pastry recipes call for oil. Oil-based pastry will be tender, but it will be mealy rather than flaky.

Water provides the moisture needed for the development of the gluten and the production of steam. You need only a small amount of water. For each 1 cup (250 mL) of flour, 2 tablespoons (30 mL) of water is ample.

Time Management Tip

Save mixing time when preparing pastry by making a large batch of piecrust mix. Cut 5 cups of shortening into a mixture of 12½ cups of flour and 2 tablespoons of salt. This mix will make 6 double-crust pies. It can be stored for up to 3 months in a sealed container or up to a year in the freezer. When you are ready to use it, place 2½ cups of mix in a bowl. In a separate bowl, combine 1 large beaten egg, ¼ cup ice water, and 1 tablespoon white vinegar. Sprinkle the liquid mixture over the piecrust mix one tablespoon at a time until the dough just begins to stick together. Then roll out pastry and fit into pie pans following standard procedures.

Activity

Have students practice various techniques for fluting the edges of an unbaked pastry crust.

Resources

- *Pastry Preparation, Activity E, SAG.* Students are to answer questions about pastry preparation.
- *Pie Recipes, recipe master 24-6, TRB.* Have students use the recipe master and additional recipes to plan a pie lab. Additional recipes should be chosen so at least one example is prepared from each of the four basic groups of pies. Have students evaluate the appearance, flakiness, and tenderness of the pastry as well as the eating quality and appearance of the filling of each pie.

Break It Down

Have students review the meaning of the term *pastry*. Have students answer questions 11-14 under *Review What You Have Read* and complete activity 3 under *Build Your Basic Skills* at the end of the chapter.

much gluten. Layers of fat physically separate the layers of gluten that form. As a result, the pastry is both tender and flaky. Too little fat will make pastry tough; too much fat will make pastry crumbly.

Water hydrates the flour so the gluten will develop. It also produces the steam needed for flakiness. The right amount of liquid will moisten the flour just enough to develop the optimum amount of gluten. Too much liquid will make the pastry tough. Too little liquid will make it crumbly and difficult to roll.

Handling the Dough

Too much flour, too much liquid, and too little fat can make pastry tough. Too much handling can also make pastry tough. Handling causes gluten to develop. The more the gluten develops, the tougher the pastry will be.

You should handle pastry gently at all times. You should also handle it as little as possible to prevent overdeveloping the gluten. It is especially important not to

- overmix the dough when adding the liquid
- use the rolling pin too vigorously when rolling the pastry
- stretch the pastry when fitting it into the pie plate

Preparing Pastry

You can use several methods to mix pastry, but the biscuit method (sometimes called the pastry method) is most popular. This method produces pastry that is both tender and flaky. See 24-11.

When making a one-crust pie you will fill after baking, flute the edges. Prick the bottom and sides of the piecrust with a fork to prevent blistering during baking. Do not prick the bottom or sides of a crust you will fill before baking.

Characteristics of Pastry

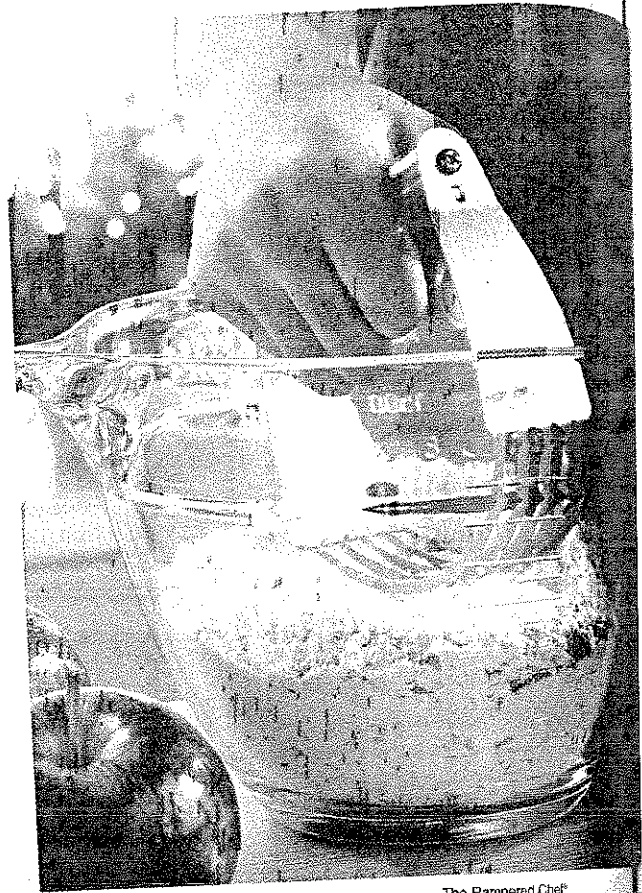
High-quality pastry is both tender and flaky. The amount and distribution of gluten determines tenderness. Flakiness is due to layers of gluten (with embedded starch grains) separated by layers of fat and expanded (puffed up) by steam.

If pastry is tender, it will cut easily with a fork and "melt in the mouth" when eaten. If pastry is flaky, you will be able to see thin layers of dough separated by empty spaces when you cut into the pastry with a fork.

Aside from having pastry that is tender, flaky, and crisp, a pie should be lightly and evenly

Interdisciplinary Connection

Incorporate science concepts into your lesson by allowing students to observe the different densities of common liquid ingredients. Working in lab groups, have students pour $\frac{1}{4}$ cup each of corn syrup, colored water, and vegetable oil into a liquid measuring cup. Have each group gently drop a chocolate chip, an ice cube, and a miniature marshmallow into the measuring cup, noting the respective densities of these foods in relation to the liquids.



The Pampered Chef

24-11 Using a pastry blender to cut shortening into flour is a basic step of preparing pastry by the biscuit method.

browned. The filling should have a pleasing flavor and be neither too runny nor too firm.

Microwaving Pie

You can prepare both pastry crusts and pies successfully in a microwave oven. You should prepare both in glass pie plates to allow the microwaves to penetrate.

Pastry crusts can be microwaved in six to seven minutes. As with many foods, however, pastry will not brown in a microwave oven. You can add cocoa or instant coffee to the flour when making pastry. You also could brush the pastry with a mixture of molasses and egg yolk before baking. Either technique will produce a crust that appears more traditionally brown.

Microwave times for pies vary according to the filling. Fruit pies are best when you place them in a preheated conventional oven for 10 to 15 minutes after microwaving.

Candy

People enjoy candy throughout the year. At holiday time, however, candy making becomes an important activity in many homes.

Homemade fudge, divinity, peanut brittle, toffee, and caramels are fun to make and give as gifts.

To make good candy, you must follow directions exactly. You must mix candies correctly and cook them to the exact temperature specified in the recipe. Otherwise, they are likely to fail.

Kinds of Candy

You can make many kinds of candy at home. A few kinds of candies do not need to be cooked, but these require special recipes. You will cook most candies. Cooked candies are either crystalline or noncrystalline candies.

Crystalline candies contain fine sugar crystals. They taste smooth and creamy. Fudge, fondant, and divinity are crystalline candies.

Noncrystalline candies do not contain sugar crystals. They can be chewy or brittle. Caramels, peanut brittle, and toffee are noncrystalline candies, 24-12.

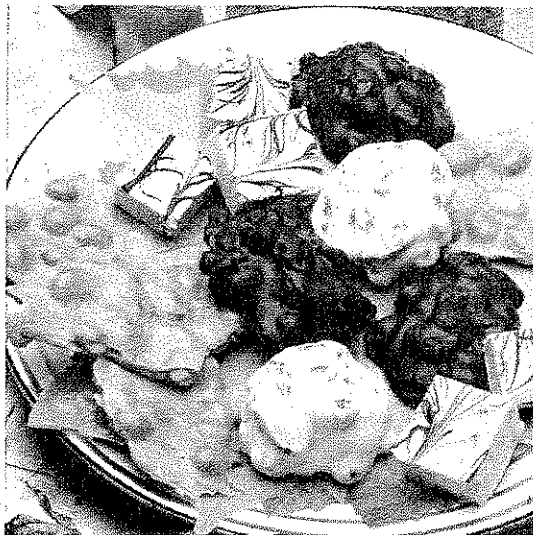
Food Science Principles of Candy Making

All cooked candies begin with **sugar syrup**. This is a mixture of sugar and liquid that is cooked to a thick consistency. Successful candy making depends on how you treat this sugar syrup.

When making crystalline candies, you want the sugar syrup to form crystals. However, you want these crystals to be very small and fine. To produce small sugar crystals, you must heat the sugar syrup to a specific temperature. You must then cool it to a specific temperature and beat it vigorously.

Fudge is one of the most popular crystalline candies. High-quality fudge tastes smooth and creamy because it contains small sugar crystals. It has a deep brown color and a satiny sheen. Poor-quality fudge tastes grainy because it contains large sugar crystals.

When making noncrystalline candies, you do not want the sugar syrup to form crystals. You can prevent crystal formation by heating the syrup to a very high temperature. You can add substances like corn syrup, milk, cream, or



National Peanut Board

24-12 Golden peanut brittle is a well-liked noncrystalline candy that many people enjoy making at home.

butter, which interfere with crystallization. You can also use a combination of high temperatures and interfering substances to prevent crystals from forming.

Peanut brittle is a popular noncrystalline candy. High-quality peanut brittle has a golden color and looks foamy. Cooking the candy to a very high temperature and using interfering substances prevent crystal formation.

Whether you are making crystalline or noncrystalline candies, temperature is very important. A candy thermometer is the most accurate method of testing the temperature of sugar syrups. Each type of candy requires a specific temperature. The candy thermometer will accurately tell you when sugar syrup reaches the correct temperature.

You will also want to use a heavy saucepan to cook candy. Mixtures that contain large amounts of sugar burn easily. A heavy saucepan will help prevent scorching.

Microwaving Candy

A microwave oven works well for melting chocolate, caramels, and marshmallows for use in recipes. These candies are less likely to stick and burn in a microwave oven than on a conventional range.

In addition to melting prepared candies, you can make fresh candy in a microwave oven. You can successfully prepare both crystalline

Discuss

Ask students how high altitudes would affect the temperatures to which candies should be cooked. (See Chapter 13, "Getting Started in the Kitchen.")

Vocabulary Builder

Have students compare the meanings of the terms *crystalline candy* and *noncrystalline candy*.

Resource

Candy, Activity F, SAG. Students are to complete exercises about the preparation of candy.

Online Resource

Have students visit the National Confectioners Association Web site at candyusa.org. Ask each student to find a historical fact, statistic, item of trivia, or nutritional point about candy to share with the class.

Resource

Candy Recipes, recipe master 24-7, TR. Have students use the recipe master and additional recipes, as desired, to plan a candy lab. Have each group complete a *Market Order Sheet* (TR) and a *Time-Work Schedule* (TR). After preparing and sampling their candy products, have each group complete a *Lab Evaluation Sheet* (TR).

FYI

Each cacao tree yields enough beans to make just one to three pounds of chocolate per year.

Break It Down

Have students review the meanings of the terms *crystalline candy*, *noncrystalline candy*, and *sugar syrup*. Have students answer question 15 under *Review What You Have Read* and complete activity 2 under *Build Your Thinking Skills* at the end of the chapter.

and noncrystalline candies. Cooking procedures for candies vary. Refer to a microwave cookbook for specific directions.

Chocolate

In the minds of some sweet lovers, no candy can match chocolate.

The most exquisite chocolates may be best left to professional candy makers. However, even novices can melt chocolate at home. You can pour melted chocolate into molds. You can use it to make clusters of raisins, nuts, or coconut. You can also dip fondant or caramels in a coating of melted chocolate, 24-13.

Chocolate is made from the beans of the cacao tree. The beans are first roasted. Then they are shelled, pressed, and heated until they form a liquid, which is called *chocolate liquor*. At this point, some of the fat, or *cocoa butter*, may be removed. However, a high cocoa butter content is a sign of quality in chocolate.

Baking and eating chocolate is made from chocolate liquor. It comes in various degrees of sweetness. *Unsweetened chocolate* contains no sugar. *Bittersweet*, *semisweet*, and *milk chocolate* each contain progressively more sugar. Sweetened chocolates also contain vanilla, and milk chocolate contains milk solids.

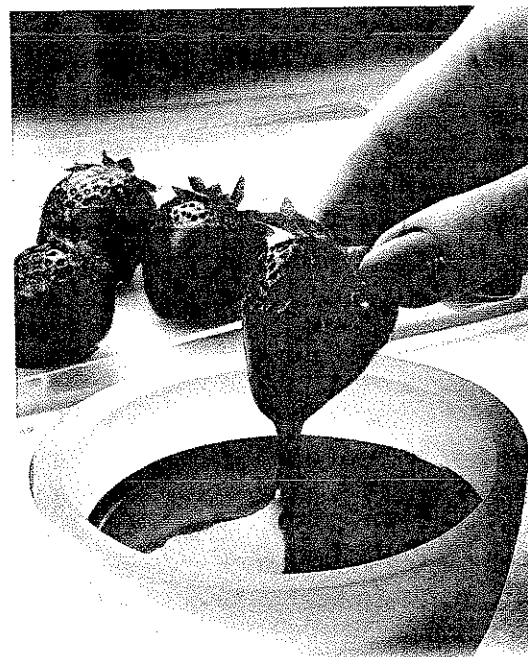
Other products related to chocolate include cocoa, white chocolate, and imitation chocolate. Cocoa is made from dried chocolate liquor that has been ground to a fine powder. *White chocolate* is made from cocoa butter, sugar, milk solids, and flavorings. Because it contains no



Sugar syrups are extremely hot and can cause severe burns if they come in contact with the skin. Use caution when handling sugar syrups. Never leave children unattended while making candy.

chocolate liquor, it is not truly chocolate. *Imitation chocolate* or chocolate-flavored products are made with vegetable oil instead of cocoa butter. Imitation chocolate is less expensive than real chocolate. However, it lacks the creamy smoothness and delicious flavor characteristic of true chocolate.

To melt chocolate, chop bars into small pieces or use chocolate chips. Place chocolate in the top of a double boiler over hot water and stir constantly. Remove chocolate from heat as soon as it is melted to prevent scorching. You can also melt chocolate in a microwave oven. Place the chocolate in a glass bowl. Microwave on high power for 30 seconds at a time until chocolate is melted. Be sure to stir the chocolate after each microwaving period.



photograph courtesy of The Reynolds Kitchens

24-13 Creamy melted chocolate makes a delicious coating for fresh strawberries.

Q: Isn't chocolate high in caffeine?

A: Chocolate supplies only a small amount of caffeine. A cup of coffee has more than 20 times the caffeine found in a serving of chocolate milk or an ounce of milk chocolate.

Think Outside the Box

Ask students what treatment they should use if someone is accidentally burned by sugar syrup when making candy. Ask what precautions students should take when working over a cooktop to prevent accidental burns.

Summary

The two basic types of cakes are shortened, which contain fat, and unshortened, which do not contain fat. Chiffon cakes are a cross between shortened and unshortened cakes. All cakes contain the same essential set of ingredients, each of which performs a specific function. You must measure ingredients carefully and then mix them using the method described in your recipe. You also must use correct pan sizes, oven temperatures, and baking times to make sure cakes bake properly. After baking, you can fill and/or frost a cake to enhance its flavor and appearance.

Rolled, drop, bar, refrigerator, pressed, and molded cookies all contain ingredients similar to cakes. You will mix most cookies by the conventional mixing method and bake them on a cookie sheet. You should store crisp cookies in containers with loose-fitting lids and soft cookies in containers with tight-fitting lids.

Pastry is the primary component of fruit, cream, custard, and chiffon pies. Flour, fat, water, and salt are the basic ingredients in pastry. Carefully measuring these ingredients and gently handling the dough will help you produce tender, flaky pastry.

You can make both crystalline and noncrystalline candies at home. Both types begin with sugar syrup. You will heat, cool, and then beat sugar syrups for crystalline candies to produce fine sugar crystals. You will heat sugar syrups for noncrystalline candies to high temperatures and/or add interfering substances to keep crystals from forming.

Review What You Have Read

Write your answers on a separate sheet of paper.

1. True or false. Both shortened and unshortened cakes contain chemical leavening agents.
2. List the seven basic ingredients of a shortened cake (other than pound cake) and briefly describe a major function of each.
3. What are two functions of cream of tartar in angel food cake?
4. What would happen if a cake were made with too much fat?
5. Why do baking pans need to be the correct size when baking a cake?
6. What are the two most common mixing methods for making shortened cakes?
7. True or false. An angel food cake should be removed from the pan as soon as it comes out of the oven.
8. True or false. Both shortened and unshortened cakes can be microwaved successfully.
9. How do proportions of cookie ingredients differ from proportions of cake ingredients?
10. Describe the appearance of cookies baked on a shiny aluminum cookie sheet and cookies baked on a dark cookie sheet.
11. How will pastry be affected if salt is omitted from the recipe?
12. List three reasons pastry might be tough.
13. What two characteristics are used to describe high-quality pastry?
14. Describe two techniques that can be used to give a brown appearance to a pastry crust prepared in a microwave oven.
15. How does a crystalline candy differ in texture from a noncrystalline candy?

Resources

- *Chapter 24 Study Sheet*, reproducible master 24-8, TR. Have students complete the statements as they read the chapter.
- *Chapter Review Games CD*. Have students play the chapter review game according to the instructions that appear on the screen.

Career Path

Have students reread the career descriptions of a cake decorator and a candy maker that appear at the beginning of the chapter. Ask students why people working in these occupations might need leadership skills.

Build Your Basic Skills

- Science.** Prepare two angel food cakes. In one cake, add cream of tartar to egg whites during beating. Do not add cream of tartar to the egg whites used in the other cake. Discuss the appearance, texture, and volume of the two cakes.
- Math.** Choose a favorite cookie recipe. Write down the amount of each ingredient you would need to prepare a double batch. Also note the yield for the double batch.
- Writing.** Prepare enough pastry for a two-crust pie. Divide the dough in half. Roll half the dough and cut it into 1-inch (2.5-cm) strips. Place the strips on a cookie sheet. Knead the other half of the dough for several minutes. Roll and cut the dough into 1-inch (2.5-cm) strips and place them on a second cookie sheet. Bake the pastry strips. After comparing the appearance and texture of the two samples, write a paragraph explaining why overhandling pastry should be avoided.

Build Your Thinking Skills

- Compare.** Prepare two batches of a shortened cake recipe—one with granulated sugar and the other with brown sugar. Store the cakes in covered containers for several days. Compare the flavor and texture.
- Analyze.** Prepare two batches of fudge. Follow directions exactly for the first batch. For the second batch, stir fudge occasionally during cooling. After the fudge has set, rate the texture, flavor, and appearance of both samples. Analyze the impact of stirring fudge during cooling.

Apply Technology

- Find out how the automatic measuring feature available on some of the newest electric mixer models works. Predict how you think this feature would affect the preparation of cake and cookie recipes.
- Prepare a cake or cookie recipe. Then prepare a second version of the recipe using an artificial sweetener in place of the sugar. Compare and evaluate the two products.

Using Workplace Skills

Judi is the pastry chef on the Caribbean Empress, which is a cruise ship noted for its world-class meals. Judi supervises three dessert cooks. Each day they prepare pastries, confections, and ice cream to coordinate with the executive chef's elaborate menus. Once a week, they also put together an expansive dessert buffet, which becomes a highlight of every cruise. Judi makes sure the cooks correctly prepare and attractively plate each of 1,800 servings of dessert daily.

To be an effective worker, Judi needs leadership skills. In a small group, answer the following questions about Judi's need for and use of these skills:

- How might Judi's leadership skills help the dessert cooks do their work?
- How might the ship's guests be affected if Judi lacks leadership skills?
- How might the Caribbean Empress be affected if Judi lacks leadership skills?
- What is another skill Judi would need in this job? Briefly explain why this skill would be important.

Answer Key to Review What You Have Read questions

- false
- Flour provides structure. Sugar provides sweetness. Eggs improve color. Liquid helps blend ingredients. Salt provides flavor. Fat tenderizes the gluten. Leavening agents make the cake rise. (Students may justify other functions.)
- (List two:) makes egg whites whiter; makes the cake grain finer; stabilizes the egg white proteins, which increases the volume of the baked cake
- Too much fat would overtenderize the gluten and weakens it. A cake made with too much fat would be heavy and coarse, and it might fall.
- If the pans are too small, the batter will overflow. If the pans are too large, the cake will be too flat and it may become dry. A cake baked in pans that are the right size will have a gently rounded top.
- conventional method, quick mix method
- false
- false
- Most cookies contain more fat and sugar and less liquid than cakes.
- Cookies baked on a shiny cookie sheet have light, delicately browned crusts. Those baked on dark cookie sheets have dark bottoms.
- Omitting salt from pastry will affect only the flavor.
- (List three:) too much flour, too much liquid, too little fat, dough overmixed, rolling pin used too vigorously, pastry stretched when fitting it into a pie plate
- tender, flaky
- Add cocoa or instant coffee to the flour when making pastry. Brush the pastry with a mixture of molasses and egg yolk.
- Crystalline candy is smooth and creamy. Noncrystalline candy may be chewy or brittle.