Culinary Institute of America

WELCOME!

Baking Boot Camp

CIAFOODIES.COM

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Expectations for Participants

To maintain safety/ sanitation standards and ensure you have the best experience possible…

Kitchen Responsibilities

- Silence and put away phones.
- Clean your workstation as you go.
- Place waste in proper receptacle:
  - **Green**: food scraps for compost
  - **Blue**: recyclables
  - **Gray**: trash for landfill
- Use paper towels, cleaning cloths, red sanitation bucket for spills.
- Use side towel for handling hot objects, not cleaning.
- Place dirty utensils, tools on speed rack, not in sink.
- Place anything with an edge in "Sharps Only" pan.
- Place dirty linen in linen bag.

Recipe Mise en Place

- Read the entire recipe before starting.
- Review yield, temp., and cook times.
- Ask questions if anything is unclear.
- Visualize the cooking process from start to finish.
- Complete any pre-steps (soak, marinade, etc.).
- Gather, measure/ weigh all ingredients.
- Complete all basic prep (wash, trim, dice, etc.).

Knife Safety

- Use a sharp knife.
- Hold the knife firmly. Place your dominant hand on the handle with three fingers gripping it. Your thumb and index finger should pinch the blade, resting on either side of the bolster.
- Cut away from your body.
- Use a cutting board.
- Place knives on flat surface, away from table edge.
- Keep knives in clear sight, never covered.
- Never grab blindly for a knife.
- Pass knives using the handle, never the blade.
- Carry knives alongside body with the point down.
- Alert others by saying "Behind you with a knife."

Food Safety

- Keep hair contained with toque, hair net/ tie.
- Wash hands before starting work.
- Wash hands after:
  - Touching hair, face, phone, pen, etc.
  - Coughing/ sneezing into tissue
- Wash and dry all produce.
- Wash cutting board, knives, tools after each use.
- Keep perishables refrigerated until needed.
- Per NY state law, wear gloves when handling ready-to-eat food.
- Keep raw meat, poultry, eggs, seafood separate from other foods.
- Cook food to the temperature safe zone.

COURSE DESCRIPTION

Welcome recruits to the Culinary Institute of America's Baking Boot Camp! During this four-day class, you will learn from the pros in an intensive yet fun-filled environment. Through lectures, demonstrations, and hands-on exercises in the bakeshop, you will learn the techniques and theories of basic baking and basic bread baking. Over the course of the week, you will be introduced to the fundamental mixing methods and techniques needed to make cookies, quick breads, and pies, and will have the opportunity each day to practice these new skills in our bakeshops. Good luck inductees!

DAY ONE: CREAMING METHOD

LEARNING OBJECTIVES

By the end of this day, you will be able to…

- list the major steps for the creaming method.
- describe how to repair a creaming method batter that has separated.
- apply the creaming method to produce a standardized product.
- assess the quality of the day's production.

LEARNING ACTIVITIES

- Lecture / Discussion
- Hands-on Production
- Product Evaluation

KEY TERMS

- Batter
- Break / separate
- Emulsify

MISE EN PLACE

Mise en place is a French term referring to the organization and completion of all the preliminary tasks involved in the preparation of a meal. Preparing the ingredients correctly, gathering the tools necessary to do the work, and setting up your station not only maximizes efficiency-- it also enhances your end results.

Performing mise en place correctly takes careful planning and anticipation of the entire task you wish to complete. Consider the following questions when setting up a workstation:

- What recipe(s) and ingredients will be needed to complete the task?
- What precautions are needed to maintain good sanitation and nutritional conditions?
- What equipment will be needed to complete the task (consider equipment needs throughout the process, including the serving container)?
- What time should the product be completed, and how does this impact the sequence in which I will approach the task?
- When working in teams, how will the tasks be divided among the members?

ORGANIZATION AND WORKFLOW

- Set up efficient workstations.
    - Table and cutting board set at correct height for individual
    - Bain-maries with hot water for tools
- Have a written daily plan. Start with the **end** in mind.
- Use standardized recipes.

BENEFITS OF MISE EN PLACE

- Increased speed and efficiency
- Professional appearance of workstation

RECIPE MISE EN PLACE

- Study the recipe carefully.
- Understand all the terms and definitions. Ask questions if you're not sure!
- Check the yield, temperatures, and cooking times.
- Assemble, in order of use, all the ingredients needed before preparation time.
- Complete necessary "pre" steps such as greasing pans, washing, cutting vegetables, and preheating the oven.
- Measure or weigh each ingredient.
- Follow the steps in the recipe exactly without leaving out any steps.
- Time the cooking period for all cooked foods accurately.

FUNCTION OF INGREDIENTS

FIVE MAJOR COMPONENTS

There are five major components found in baking. While possible, it is unusual for baked goods to contain all five components:

- **Flour**
- **Liquid**
- **Fat/ Oil**
- **Egg**
- **Sugar**

FLOUR

Flour is probably the most important ingredient used in the production of baked goods. Few items can be produced without this ingredient. Flour can be derived from a number of grain and vegetable sources, but it is the flour milled from wheat that is most commonly used. Flour can vary considerably, yielding correspondingly different results in the finished product.

FLOUR SERVES FIVE PRIMARY FUNCTIONS IN BAKING

- **Backbone and structure:** Flour is used in greater quantities than any other ingredient, forming the bulk of most bakeshop formulas.
- **Characteristic texture and appearance:** Derived by the different strengths and varieties of flour available.
- **Binding and absorbing agent:** Flour doesn't dissolve when it comes in contact with a liquid-- it absorbs it.
- **Flavor**: Derived from the different types of flour
- **Nutritional value:** Contains proteins, carbohydrates, vitamins, minerals, and fats.

WHEAT FLOUR

Flour is the main ingredient of a bread loaf and determines its flavor and texture. Bread can be made from different grains, such as rye, barley, and buckwheat, but only wheat flour contains the protein that can be converted into gluten. Strong or hard flour makes better bread. White, soft flour has a high-starch, low-gluten

content and is better suited for baking cake. Hard, wheat flour has a higher protein content and feels more granular. In contrast, soft flour can feel like talcum powder. Hard flour makes bread with better rise and more open texture. Brown flour makes heavier bread than white flour. Whole-wheat flour makes denser bread than white flour, because it contains not only endosperm, but the bran and wheat germ as well.

HARD AND SOFT WHEAT FLOUR

The hardness is determined by the ratio of gluten to starch.

- **Hard**: Spring wheat or winter wheat contains 11-15% protein
- **Soft**: Spring wheat contains 6-10% protein

In general, hard wheat flour is used for breads and other yeast-raised products, where a higher gluten content is necessary to hold the carbon dioxide that leavens the item. Bakers prefer to blend their own flours to meet their specific needs, or else use the hard or soft flour that is best suited to a particular formula.

HARD FLOURS: HIGHER GLUTEN CONTENT, LOWER STARCH CONTENT

- **Straight/ high gluten:** Hardest of all flours, used for hard rolls
- **Patent/ Bread:** Used for breads and soft rolls
- **First clear:** High in gluten, darker in color, used as a wheat component in rye breads
- **Bran:** The bran separated from the above flours during milling, used to make flour for muffins and specialty breads
- **Whole wheat/ Graham:** The entire wheat kernel, higher in fat and other nutrients than other flours, used for breads, rolls and muffins

Soft Flours: Higher Starch Content, Lower Gluten Content

- **Cake flour:** Used for cakes and cookies
- **Pastry flour:** Used for pie doughs

SPECIALTY FLOURS

Rye, pumpernickel, barley, buckwheat, potato, rice, corn, and soy flours all contribute distinctive tastes and textures as well as nutrition and variety. However, they are low

in gluten content and generally have a percentage of wheat flour added to achieve proper leavening.

ALL-PURPOSE FLOUR

A blend of approximately 50% hard and 50% soft wheat flour used in a wide variety of baked goods.

GLUTEN

Two proteins in wheat flour form gluten:

- Gliadin
- Glutenin

When the two proteins are mixed with a liquid, they undergo a molecular change to create a new protein, gluten. Mixing and kneading causes the gluten to form elastic strands that allows dough and batter to stretch and hold the expanding gases that are produced during leavening. This creates breads that are light and airy. Only wheat contains enough gliadin and glutenin to produce the quantities of gluten necessary for this to occur.

LIQUIDS

When the protein of flour is mixed with water, gluten is formed; this feels sticky and rubbery and is an elastic framework of protein molecules. In bread making, the gluten stretches and traps, within the dough, the carbon dioxide released by the yeast. When the loaf is baked, the gluten coagulates and sets into the airy, spongy form of the bread. Water makes a plain, crusty loaf. The addition of milk not only flavors the bread but also gives the crust a softer, more golden texture. Bread made with milk has enriched food value and keeps longer than plain bread. For certain breads, this softer texture may be desirable.

WATER EXISTS IN THREE DISTINCT FORMS

- **Solid:** such as ice
- **Liquid:** its most common form
- **Gas:** when heated above 212°F

The liquid and gaseous states are most useful to the baker.

WATER AS A LIQUID

- Acts as a solvent for the water-soluble ingredients (salt, sugar)
- Helps even distribution of other ingredients (yeast, spices)
- Changes the proteins in flour into gluten

WATER AS A GAS

Changes to steam upon reaching 212°F in the oven (steam expands and helps leaven the product). Generally, the greater the water content, the more open the grain and softer the crumb. In bread making, water often serves as the primary liquefier. In recipes for other baked goods, milk is usually used.

MILK AND MILK PRODUCTS

Milk is 88% water, 3 ½% fat, and 8 ½% milk solids. One-gallon whole milk weighs about 8 ½ lb., contains ⅞ water and ⅛ milk solids.

FUNCTIONS

- **Helps in the Development of Gluten** because it is a liquid
- **Increases Keeping Qualities**
- **Develops Crust and Color**: Sugar (lactose) in milk caramelizes and creates a rich color on the product's surface; it can also aid in development of a firm crust
- **Develops Grain and Texture:** Lactic acid in milk has a tightening effect on gluten, increasing stability, results in an item with fine grain and texture

- **Improves Appearance:** The opaque whiteness of the milk itself is imparted to the interior of breads and cakes; this together with the effects of the first two functions creates a more attractive product

- **Adds Nutritional Value: Whole milk contains approximately:**

  3.7% Milk sugar

  2.9% Butterfat

  2.9% Protein

  6% Minerals

- **Improves Eating Quality:** Richer, better flavor than water

PASTEURIZATION

Pasteurization is the process of heating the milk to 161°F for 15 seconds then cooling rapidly. This kills harmful bacteria. Milk products with a higher % of fat are heated to either 150°F for 30 minutes or 166°F for 30 seconds for ultra pasteurization. Date stamp is 10 days after the date of pasteurization. Homogenization is the process of forcing the milk through tiny holes to break up the fat particles, so they remain evenly dispersed throughout the milk.

TYPES OF MILK

- **Skim Milk/ Nonfat:** all or most of the fat removed. ½ % or less fat.
- **Lowfat:** 0.5% - 3%
- **Buttermilk:** The liquid remaining after cream is churned to make butter.
- **Cultured Buttermilk:** skim milk to which a bacteria culture has been added which converts the milk sugar to lactic acid.
- **Evaporated Milk:** whole or skim milk heated to remove 60% of the water, then sterilized & canned.

- **Condensed Milk:** the same as evaporated with the addition of 45-50% sugar. 30% water, 40% sugar, remaining milk solids (8% fat, 7 ¾% protein, 10 ½% milk sugar), 1 ¾% mineral.
- **Dried Milk:** milk that is rapidly evaporated by heat. It shouldn't contain more than 5% moisture.

TYPES OF CREAM

- **Whipping Cream:** 30 - 36% butterfat
- **Heavy Cream:** 36 - 40% fat
- **Light Cream:** 18 - 30% fat
- **Half and Half:** 10 ½ - 12% fat

Ultra pasteurized lasts longer but doesn't whip as well. It may contain vegetable gums to compensate.

SOUR CREAM- 16 - 22% fat. Made by adding a bacteria to pasteurized cream to produce lactic acid, then left for a couple of days.

FATS/OILS IN BAKING

Fat/Oil is not an essential ingredient but may be added for flavor, and to enrich the bread. Fat softens the gluten and makes closer-textured, moister loaves. Bread enriched with fat keeps better.

SHORTENING AGENTS

Animal fats (Butter and Lard)

Vegetable oils (after various degrees of processing)

Hydrogenated form (solid shortenings)

Natural (oil)

FUNCTION OF SHORTENING

- **Alters Eating Qualities**: Results in products that are more tender and less chewy than lean dough products; in addition, some fats or oils add flavor.

- **Alters Appearance**: Shortening agents do not dissolve in doughs but become evenly dispersed and incorporate air, resulting in soft crumb in breads, making the products visually distinct compared to lean dough products.
- **Improves Keeping Quality**: Shortening acts as an emulsifier and makes it possible to incorporate greater quantities of liquids; this prevents rapid drying out of products.
- **Adds Food Value**: Fats constitute a concentrated source of energy for the body.

EGGS IN BAKING

Eggs add flavor and color to bread and contribute to the leavening process. A glaze of egg bakes golden like a layer of varnish and gives a more tender crust.

FUNCTIONS OF EGGS IN BAKING

- **Color**: This is the primary function of the yolk, which plays a major role in the eye appeal of such items as custards, yellow sponge cakes and egg breads.
- **Texture and Grain**: The coagulating, foaming and emulsifying properties of eggs all help to incorporate and distribute air into mixtures and hold it there during baking, as well as promote an even grain and fine texture in the finished product.
- **Structure**: The proteins in eggs reinforce the gluten in flour to help maintain the stability and structure of the product during baking.
- **Flavor**: This is mostly the function of the yolk as egg whites have relatively little flavor. The fat and other nutrients in the yolk contribute aroma as well as taste, resulting in products with enhanced appeal.
- **Nutritional Value**: Eggs contain 75% moisture. The remaining 25% of the egg contains protein, fat, sugar, potassium, sodium, calcium, and iron.

SUGARS

While sugar sweetens bread, it also makes the texture tender by softening the gluten. Sugar also gives the loaf a browner crust. A little sugar added to bread dough accelerates the yeast's action, but high concentrations of sugar can kill the yeast. It should be kept in mind that both wild and commercial yeasts obtain needed sugars by converting the starch in the grain into simple sugars, and it is not

necessary to add granulated sugar to bread doughs in order to obtain a good finished product.

Six Main Functions of Sugars in Baking

- **Adds Sweetness**
- **Affects Grain and Texture:** Sugar has a denaturing effect on the gluten in flour, acting together with the delay in gelatinization; this produces a softer crumb and finer grain in breads. For certain breads this may be desirable.
- **Retains Moisture and Prolongs Freshness:** Sugar absorbs moisture from other ingredients as well as from the atmosphere; this keeps a finished product moist and delays drying out.
- **Imparts Crust Color:** Sugar caramelizes and helps form a browner, firmer crust during baking.
- **Contributes Food Value:** Sugar in moderate amounts can supply some of the carbohydrate requirements of a normal diet.
- **Aids in Fermentation of Yeast:** A small amount of sugar supplies a source of food for yeast.

Creaming Method

This method is used primarily for cookie doughs and pound cakes and in recipes where the flour is equal to or greater than the sugar content. Air is introduced during the creaming or first step of this method. Sugar's crystalline structure introduces thousands of small air cells into the fat during creaming where they are held throughout mixing and during baking. As the batter is heated, these air cells expand to leaven the item. The increased ratio of stabilizers requires the additional mechanical leavening of the incorporated air as well as the chemical leavening produced by baking powder or baking soda. A greater ratio of stabilizers can also result in batters that are thick enough to require being piped out from a pastry bag, such as cookies.

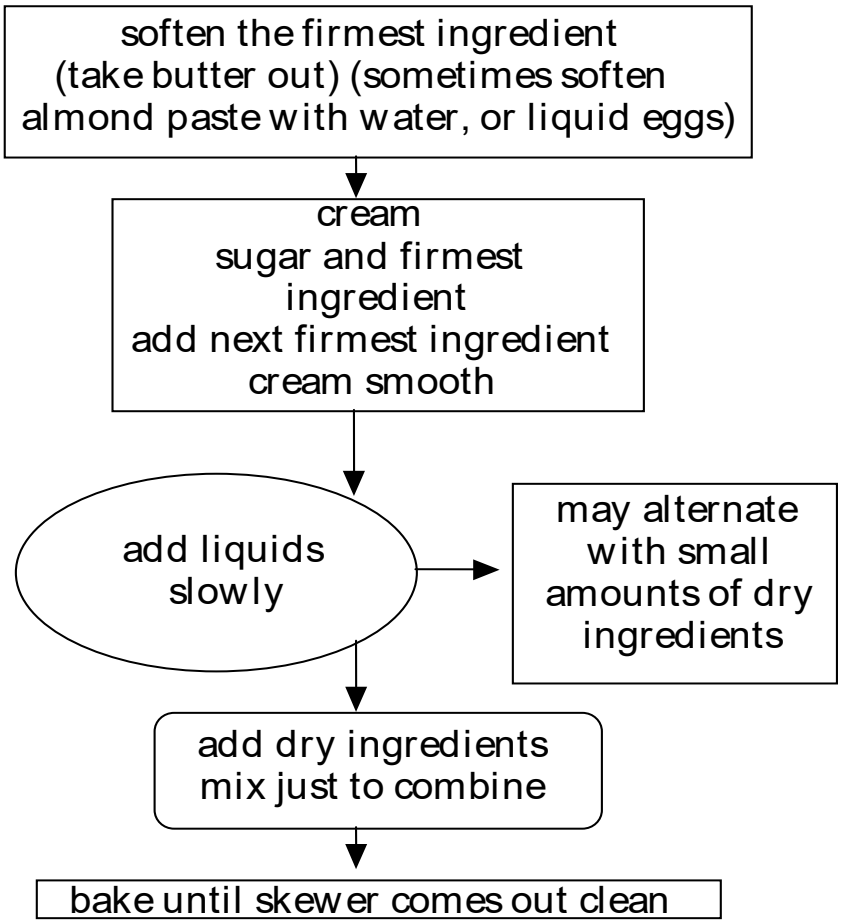
Mixing Procedure

1. Cream fat and sugar together
2. Add flavorings, mix well
3. Gradually add eggs
4. Add liquid (if adding a large amount of liquid, alternate with additions of flour)
5. Add dry ingredients
6. Mix until smooth (do not overmix)
7. Bake

CHART OF CREAMING MIXING METHOD

Ingredient	Action	Reason
Sugar Butter	Combine and cream until smooth and light.	To incorporate air into the fat and sugar mixture
Eggs	Gradually add and scrape as necessary.	To allow the eggs to mix in and emulsify with the fat and the sugar.
Flour (or other dry ingredients)	Sift together. Add on low speed. Mix until combined. Do not overmix.	To incorporate the dry ingredients smoothly and thoroughly without overmixing.

CREAMING METHOD FOR CAKES, DOUGH, BATTERS



DAY ONE: TEAM PRODUCTION ASSIGNMENTS

TEAM ONE:

Lemon Poppy Seed Loaf

Pecan Sablé

TEAM TWO:

Marble Pound Cake

Vanilla Kipferl

TEAM THREE:

Cranberry Orange Loaf

Mexican Wedding Cookies

TEAM FOUR:

Lemon Loaf

Chocolate Mint Cookies

TAKE HOME RECIPES:

Banana Bread

Shortbread

Mudslide Cookies

PREP FOR DAY TWO:

Scale ingredients for Pie Dough

Scale ingredients for Scones or Biscuits

LEMON POPPY SEED LOAF

Yield: 1 loaf

Ingredients	Amounts
Flour, pastry	13 oz.
Baking powder	1 Tbsp.
Sugar, granulated	10 oz.
Butter, unsalted	9 oz.
Sour cream	5 oz.
Egg, whole	9 oz.
Oil, vegetable	2 oz.
Lemon, juice, fresh	1 oz.
Lemon, zest	1 ½ oz.
Poppy seeds	1 ¾ oz.

Method

1. Preheat oven to 350°F.
2. Spray a loaf pan with cooking spray and line with parchment paper. Reserve.
3. In a large bowl, sift together the flour and baking powder. Reserve.
4. In a stand mixer fitted with the paddle attachment, place the butter and sugar. Cream on medium speed until light and fluffy. Reserve.
5. In a medium bowl, place the sour cream, eggs, oil, lemon juice, lemon zest, and poppy seeds. Mix to combine. Add half of the mixture to the mixer bowl. Mix on low speed until just combined.
6. Add half the flour mixture. Mix on low speed until just combined.
7. Add the remaining wet mixture, mixing until just combined.
8. Add the remaining flour mixture, mixing until just combined.
9. Transfer the batter to the prepared loaf pan.
10. Bake in the preheated oven until the loaf is evenly browned, springs back, and a skewer inserted in the center comes out clean, about 40 minutes.

PECAN SABLÉ

Yield: 240 pieces

Ingredients	Amounts
Butter, unsalted	1 lb. 8 oz.
Sugar, granulated	8 oz.
Heavy cream, warmed slightly	8 oz.
Vanilla, extract	to taste
Flour, cake, sifted	1 lb. 12 oz.
Pecans, pieces, coarsely ground	1 lb. 4 oz.
Egg, white	as needed
Sugar, granulated	as needed

Method

1. Preheat oven to 350°F.
2. In a stand mixer fitted with the paddle attachment, place the butter and sugar. Cream on medium speed until light and fluffy. Reserve.
3. With the mixer on low speed, gradually add the warm heavy cream and vanilla extract. Mix until just incorporated, scraping down the sides and bottom of the bowl frequently.
4. Add the flour and pecans all at once. Mix until just combined. Do not over mix.
5. Shape the dough into 14 oz. logs. Wrap them in parchment. Refrigerate until firm.
6. Unwrap the dough, brush with the egg whites, and roll in the sugar.
7. Slice the dough ¼-inch thick. Arrange on parchment-lined sheet pans.
8. Bake in the preheated oven until slightly browned around the edges, 10 to 15 minutes.

MARBLE POUND CAKE

Yield: 2 cakes

Ingredients	Amounts
Salt, kosher	1 tsp.
Flour, cake	12 oz.
Cornstarch	2 ½ oz.
Baking powder	½ tsp
Butter, unsalted, soft	10 oz.
Sugar, granulated	12 oz.
Lemon, zest	1 Tbsp.
Egg, whole, room temp	1 lb.
Chocolate, bittersweet, melted	6 oz.

Method

1. Preheat oven to 350°F.
2. Spray 2 loaf pans with cooking spray and line with parchment paper. Reserve.
3. In a large bowl, sift together the salt, cake flour, cornstarch, and baking powder. Reserve.
4. In the bowl of a stand mixer fitted with the paddle attachment, place the butter and sugar. Cream, starting on low speed and increasing to medium speed, until smooth and light, about 5 minutes.
5. In a medium bowl, place the lemon zest and eggs. Mix to combine.
6. With the mixer on low speed, add half of the egg mixture, scraping the sides and bottom of the bowl. Add half of the flour mixture, scraping down the sides and bottom. In two more additions, alternate adding the remaining egg and flour, scraping down between additions.
7. Transfer one-third of the batter to a separate mixing bowl. Fold in the chocolate.
8. Pour the chocolate batter back into the plain batter. Using the handle of a wooden spoon, swirl it together with 3 or 4 movements. Do not over mix.
9. Scale 1 lb. 13 oz. of batter into each of the prepared loaf pans. Bake in the preheated oven until a toothpick inserted into the center of the cake comes out clean, 45 to 50 minutes.
10. Cool slightly in the pans. Unmold and cool completely on wire racks.

VANILLA KIPFERL

Yield: 2 dozen cookies

Ingredients	Amounts
Hazelnuts	4 oz.
Butter, unsalted	14 oz.
Sugar, confectioner's, 6x	6 oz.
Salt, kosher	⅛ tsp.
Cinnamon, ground	1 tsp.
Egg, yolk	21 g
Vanilla, extract	1 ½ tsp.
Flour, cake, sifted	1 lb.
Sugar, vanilla	as needed

Method

1. Preheat oven to 350°F.
2. Place the hazelnuts on a sheet pan in an even layer. Toast in the oven, shaking the tray occasionally to prevent burning, until golden brown, 8 to 10 minutes. Transfer the hazelnuts to a small bowl. Cool.
3. In a food processor, grind the hazelnuts into a coarse flour. Reserve.
4. In the bowl of a stand mixer fitted with the paddle attachment, place the butter, sugar, salt, and cinnamon. Cream on medium speed until light and fluffy.
5. Gradually add the egg yolk and vanilla, scraping down the sides and bottom of the bowl.
6. Add the flour and ground hazelnut. Mixing until just combined.
7. Roll the batter into a 3/8-in. thick cylinder. Cut into two-inch lengths. Form into a crescent shape. Transfer to a parchment-lined sheet pan.
8. Bake in the preheated oven until lightly golden brown, 10 to 12 minutes.
9. While still warm, toss the cookies in the vanilla sugar.

Note: Other nuts, such as walnuts, can be substituted for the hazelnuts.

CRANBERRY ORANGE LOAF

Yield: 5 small loaves

Ingredients	Amounts
Butter, unsalted	10 ½ oz.
Sugar, granulated	15 oz.
Egg, whole	5 ea.
Orange, zest	1 oz.
Flour, bread	1 lb. 5 oz.
Baking powder	1 Tbsp. + 1 tsp.
Salt, kosher	¾ tsp.
Milk, whole	9 oz.
Cranberries, dried	14 oz.

Method

1. Preheat oven to 350°F. Grease and flour a 9x5-inch loaf pan.
2. In the bowl of a stand mixer fitted with the paddle attachment, place the butter and sugar. Cream on medium speed until light and fluffy.
3. Gradually add the eggs and orange juice, scraping down the bowl with each addition.
4. In a medium bowl, sift together the flour, baking powder, and salt. Add it to the mix.
5. Add the milk. Mix on 2nd speed until fully incorporated and smooth, about 5 minutes.
6. Dust the cranberries with flour. Fold them into the batter.
7. Transfer the batter to the prepared pan.
8. Bake in the preheated oven until well browned and a skewer inserted in the center comes out clean, 35 to 40 minutes.
9. Let it cool in the pan for 5 minutes. Turn out onto a wire rack to cool completely.

MEXICAN WEDDING COOKIES

Yield: 100 cookies, ½-ounce each

Ingredients	Amounts
Butter, unsalted	1 lb.
Sugar, confectioner's, 6x	4 oz.
Flour, all-purpose	1 lb. 1 oz.
Walnuts, chopped	12 oz.
Vanilla, extract	¼ oz.
Rum	¼ oz.
Sugar, confectioners', 6x	as needed

Method

1. Preheat oven to 350°F.
2. In the bowl of a stand mixer fitted with the paddle attachment, place the butter and sugar. Cream on medium speed until light and fluffy.
3. Add the vanilla and rum.
4. Add the flour and walnuts. Mix on low speed just until incorporated.
5. Scoop the dough into 1 teaspoon balls using a #100 scoop. Arrange on parchment-lined sheet pans.
6. Bake in the preheated oven until the cookies are light golden around the edges, 10 to 12 minutes.
7. While still warm, toss the cookies in confectioners' sugar to completely coat. Cool. toss in confectioners' sugar again.

LEMON LOAF

Yield: 4 small loaves

Ingredients	Amounts
Flour, pastry	12 oz.
Baking powder	½ tsp.
Butter, unsalted	12 oz.
Sugar, granulated	12 ½ oz.
Egg, whole	9 ½ oz.
Salt, kosher	¾ tsp.
Sour cream	2 ¾ oz.
Vanilla, extract	⅓ oz.
Lemon, zest	3 oz.
Lemon, sûpremed	3 ea.
Lemon, juice, fresh	10 oz.
Sugar, powdered	9 oz.
Fondant	5 oz.

Method

1. Preheat oven to 350°F. Grease and flour four loaf pans. Reserve.
2. In a medium bowl, place the pastry flour and baking powder. Mix to combine. Reserve.
3. In the bowl of a stand mixer fitted with the paddle attachment, place the butter and sugar. Cream on medium speed until light and fluffy.
4. Gradually the eggs one at a time and the salt, scraping down the bowl well with each addition.
5. In a medium bowl, place the sour cream, vanilla extract, lemon zest, and sûpremes. Mix to combine.
6. With the mixer on low speed, alternately add the flour mixture and sour cream mixture, scraping down with each addition.
7. Fill the prepared pans with batter.
8. Bake in the preheated oven until the cake springs back to the touch and a skewer comes out clean, about 40 minutes.
9. For the lemon syrup, in a medium saucepan over medium-low heat, place the lemon juice, powdered sugar, and fondant. Heat, stirring continuously, until combined.
10. Brush the syrup over the warm loaves until they have absorbed all the syrup.

CHOCOLATE MINT COOKIES

Yield: 5 dozen cookies

Ingredients	Amounts
Butter, unsalted	1 lb. 2 oz.
Sugar, granulated	2 lb.
Chocolate, semi-sweet, melted	1 lb. 2 oz.
Vanilla, extract	1 oz.
Egg, whole	9 ea.
Mint, extract	7 g
Flour, all-purpose	3 lb. 4 oz.
Baking powder	23 g
Baking soda	20 g
Milk, whole	2 oz.
Chocolate, white, chips	1 lb.
Chocolate, coating	8 oz.

Method

1. In the bowl of a stand mixer fitted with the paddle attachment, place the butter and sugar. Cream at medium speed until light and fluffy.
2. Add the melted chocolate. Mix on low speed until incorporated.
3. Add the vanilla. Mix until incorporated.
4. Add the eggs one at a time, mixing with each addition until incorporated. Scrape down the bowl after each addition.
5. Add the mint extract. Mix until incorporated.
6. In a large bowl, sift together the flour, baking powder, and baking soda. Add it to the bowl of the stand mixer.
7. While on low speed, add the milk. Mix until incorporated.
8. Stir in the chocolate chips. Mix until incorporated.
9. Using parchment paper, shape the dough into 20-ounce logs. Freeze the cookie log until it is firm enough to cut, 2 to 3 hours or overnight.
10. Preheat oven to 350°F.
11. Cut the log into ⅛-inch thick slices. Arrange the slices on a parchment-lined sheet pan.
12. Bake in the preheated oven until the cookies start to set. Remove the pan from the oven and allow the cookies to completely cool in the pan.
13. In a saucepan over medium heat, add 2 inches of water. Place a dry, shallow, heat-safe mixing bowl over the saucepan. Add the chocolate to the bowl. Heat the chocolate, stirring continuously, until fully melted.
14. Dip ⅓ of each cookie in the coating chocolate.

BANANA BREAD

Yield: 2 loaves

Ingredients	Amounts
Flour, all-purpose	15 oz.
Baking powder	1 tsp.
Baking soda	1 ½ tsp.
Salt, kosher	½ tsp.
Banana, very ripe, unpeeled	22 oz. (1 ½ lbs.)
Lemon, juice, fresh	1 tsp.
Sugar, granulated	15 oz.
Egg, whole	4 oz.
Oil, vegetable	4 ½ fl. oz.
Pecans, coarsely chopped	3 oz.

Method

1. Preheat oven to 350°F.
2. Coat 2 loaf pans with cooking spray.
3. In a large bowl, sift together the flour, baking powder, baking soda, and salt. Reserve.
4. Peel the bananas. Transfer to a medium bowl. Mash with your hands. Add the lemon juice.
5. In the bowl of a stand mixer fitted with the paddle attachment, place the banana mixture, sugar, eggs, and oil. Mix on medium speed until blended. Scrape down the bowl as needed.
6. Add the sifted dry ingredients. Mix on low speed until just combined. Scrape down the bowl as needed.
7. Mix in the pecans.
8. Scale 2 pounds of batter into each prepared pan. Gently tap the filled pans to burst any large air bubbles.
9. Bake in the preheated oven until the bread springs back when pressed and a tester inserted near the center comes out clean, about 55 minutes.
10. Cool the loaves in the pans for 5 minutes. Turn out the loaves onto wire racks to cool completely.

SHORTBREAD

Yield: 3 dozen

Ingredients	Amounts
Sugar, granulated	12 oz.
Butter, unsalted	11 oz.
Egg, yolk	2 oz.
Orange, zest	14 g
Flour, cake	8 oz.
Flour, bread	8 oz.
Salt, kosher	1 pinch
Egg, white, beaten	as needed
Almonds, sliced, blanched	as needed
Sugar, vanilla	as needed

Method

1. Preheat oven to 350°F.
2. In the bowl of a stand mixer fitted with the paddle attachment, place the butter and sugar. Cream on medium speed until light and fluffy. Reserve.
3. Add the eggs one at a time, scraping down the bowl after each addition.
4. Add the orange zest, cake flour, bread flour, and salt. Mix on low speed to form a dough.
5. Roll the dough into a ⅛-inch thick rectangle on parchment paper. Keep the dough as rectangular as possible to lessen waste when cutting. Chill in the freezer for 30 minutes.
6. Use a serrated wheel cutter to cut 1 ½ x 1 ½- inch squares.
7. Brush the tops with the egg whites. Sprinkle with the almonds and vanilla sugar.
8. Bake in the preheated oven until lightly browned.

MUDSLIDE COOKIES

Yield: 3 dozen cookies

Ingredients	Amounts
Chocolate, bittersweet	1 lb.
Chocolate, unsweetened	5 ½ oz.
Butter, unsalted	2 ½ oz.
Egg, whole	6 ea.
Sugar, granulated	1 lb.
Coffee, extract	1 ¼ tsp.
Vanilla, extract	1 tsp.
Flour, cake	2 ½ oz.
Baking powder	1 ½ tsp.
Salt, kosher	⅛ tsp.
Chocolate, chips	1 lb. 2 ½ oz.
Walnuts	5 ½ oz.

Method

1. Preheat oven to 350°F.
2. Using a double boiler, melt the chocolates and butter together.
3. In a stand mixer fitted with a whisk attachment, whip the eggs, sugar, and vanilla extract until it increases volume and looks slightly pale, about 3 minutes.
4. Pour the chocolate mixture into the egg mixture. Scrape down the sides to fully combine.
5. In a large bowl, sift together the flour, baking powder, and salt. Add it to the egg/chocolate mixture in the mixer bowl.
6. Change to a paddle attachment. Mix on low speed until just combined with no streaks of dry ingredients visible. Scrape down the sides to fully combine.
7. Remove the bowl from the mixer. Using a rubber spatula, fold in the chocolate chips and walnuts to fully incorporate. If the dough is very soft, refrigerate until firm before scooping.
8. Scoop the dough onto baking sheets. Place the sheets in the freezer until the cookies are firm.
9. Bake in the preheated oven until just set, 8 to 10 minutes. The middle will still be very soft when this cookie is done baking. Only the sides will be firm to the touch. These cookies should be very dense and moist. Be careful not to over bake.

Variation: Dried cherries or cranberries can be substituted for the chocolate chips.

DAY TWO:
RUBBED-DOUGH METHOD

LEARNING OBJECTIVES

By the end of this day, you should be able to…

- define the rubbed-dough method.
- list the ingredients and their ratio for pie dough.
- explain how the cut-in pieces of fat leaven dough made by the rubbed-dough method.
- apply the rubbed-dough method to prepare 3-2-1 pie dough.
- assess the quality of the day's production.

LEARNING ACTIVITIES

- Lecture / Discussion
- Hands-on Production
- Product Evaluation

KEY TERMS

- Flaky
- Mealy

RUBBED-DOUGH METHOD

The rubbed-dough method is used for incorporating high proportions of fat into flour to achieve a desired final dough consistency. For example, in pie dough, one can control the texture of the final crust by simply adjusting the size of the fat into the flour. Larger fat pieces will yield a flakier crust, and smaller fat pieces will yield a smoother, tighter-textured crumb. After the fat is incorporated into the flour, just enough liquid is added to bind the ingredients into dough. Smaller fat pieces mean a more thorough distribution of fat and less liquid will be absorbed than that in flakier dough.

DOUGH'S RESPONSE TO BAKING

The fat remains in discrete pieces in the mixture; when these melt into the flour during baking, they leave little pockets of air which expand as their temperature rises, creating a light finished product. A larger air pocket will translate to flakiness to the palate while smaller pockets will appear to be mealy.

METHOD

1. Combine the fat and flour and rub together until the desired fat sizes are achieved.
2. Dissolve the salt in liquid, add it to the dry ingredients, and mix gently until the liquid is absorbed completely. Do not over-mix.
3. Scale and use as desired.

EXAMPLES OF RUBBED-DOUGH METHOD PRODUCTS

- 3-2-1 Pie Dough
- Irish Soda Bread
- Scones
- Biscuits

PIE DOUGH

DOUGH COMPONENTS

- **Flour:** Pastry flour is the best choice, but any low protein flour can be used successfully.
- **Fat:** Butter will provide the best flavor but is difficult to handle. The most popular fat is regular hydrogenated shortening. To achieve both a desirable flavor and ease of handling, butter, lard, and other fats are often blended with the shortening.
- **Liquid:** Water is used and must be cold to keep fat from melting.
- **Temp:** The dough must be kept cool during mixing and make-up.

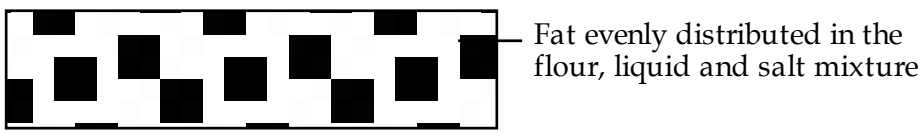
TWO TYPES OF PIE/ TART DOUGHS

Flaky Dough

The fat or shortening is "cut" into the dry ingredients until the fat is approximately the size of dried lentils. Water is then added and worked just enough to allow the flour to absorb the liquid. At this point the dough needs to rest and cool. Rolling the dough causes flakes or layers of flour and fat to develop. As the dough bakes the fat melts and separates the mixture of flour and water into layers.

Mealy Dough

Fat and flour are combined and rubbed together until the mixture is homogeneous. This even distribution of fat results in a mealy, crumbly texture. Liquid is then added, and the mixture is worked just to combine.



ROLLING PIE AND TART DOUGH

- Be sure the dough is well chilled to ensure that the fat does not melt and makes the dough much easier to handle.
- The dough should be rolled on a clean work surface that has been lightly dusted with flour to prevent it from sticking to the rolling pin and bench.
- Bread flour is the choice for this application because it is lower in starch than pastry, cake, and all-purpose flours and will not be readily absorbed into the raw dough.
- Regularly turn the dough while rolling to help prevent the dough from sticking to the work surface. This will ensure uniform shape and thickness, as well as reduce the amount of dusting necessary. Evenly rolled dough is very important for uniform baking and browning.
- Work quickly to prevent the fat from softening, which can ruin the texture of the dough. Some doughs that are particularly delicate or tender may have to be refrigerated intermittently during rolling and forming to prevent this from occurring.
- If the dough should tear during the rolling process, it can be patched by placing a small piece of dough over the tear and then rolling over it until the patch is concealed and dough is smooth.
- Dough for large pies and tarts (8-inches and above) should be rolled to ⅛-inch thickness. Dough to be used for smaller or individual pastries should be rolled to 1/16-inch thickness. If the dough for a pie or tart is too thick, it may not bake completely or properly, and its flavor and texture can overwhelm the flavors in the filling.
- To move the dough into the pan, pick it up by wrapping it around the rolling pin, then gently unroll it over the pan.
- Scraps of leftover dough may be combined and reused one time. Lay them flat, pile them up, roll into a cohesive mass, then refrigerate until firm before using a second time.

QUICK BREADS: SCONES AND BISCUITS

Quick breads refer to a large group of baked goods that includes biscuits, muffins, scones, popovers, and a variety of sweet and savory loaf breads. Quick breads do not contain yeast as a leavening agent.

COMMON LEAVENING AGENTS USED IN QUICK BREADS

Baking powder consists of a mild acidic and a mild alkali that react when exposed to water and produce carbon dioxide. The alkaline ingredient is generally baking soda. The acidic ingredient is tartaric acid (cream of tartar) or sodium pyrophosphate or a combination of both substances. The first baking powder came on the market in 1850. There are two types of baking powders:

- **Single-acting baking powder** requires only moisture to release gas. The moisture is supplied by eggs, milk, water, or other liquid in the batter. Batters using single-acting baking powder must be baked immediately.
- With **double-acting baking powder**, a small amount of gas is released when contact with moisture is made, and then there is a stronger release when heat is applied. Batters made with double-acting baking powder can sit a short time without losing too much leavening ability.

Baking soda releases gas only if both an acid and moisture are present. Heat is not necessary for this to occur, so the batter must be baked immediately. Acids commonly used with baking soda include buttermilk, sour cream, lemon juice, honey, molasses, and fresh fruit. Baking soda and baking powder are often used together in batters.

DAY TWO: TEAM PRODUCTION ASSIGNMENTS

ALL TEAMS:

Prepare 3-2-1 Pie Dough

Finish Cookies

TEAM ONE:

Biscuits

TEAM TWO:

Cherry Scones

TEAM THREE:

Ham and Cheese Scones

TEAM FOUR:

Apple Walnut Cinnamon Scones

TAKE HOME RECIPE:

Cranberry Orange Scones

3-2-1 PIE DOUGH

Yield: 6 pounds

Ingredients	Amounts
Flour, pastry	3 lb.
Salt, kosher	1 ½ Tbsp.
Butter, unsalted, cold, cut into bits	2 lb.
Water, cold	1 lb.

Method

1. Preheat oven to 400°F.
2. In a large bowl, whisk together the flour and salt until evenly distributed.
3. Add the cold butter.
4. For flaky pie dough (top crust) using your fingertips, rub the cold butter into the flour to form large nuggets/ large pea-sized pieces remain. This produces a light, layered, crisp texture that browns beautifully.
5. For mealy pie dough (bottom crust), using your fingertips, rub the cold butter into the flour to resemble crumb topping. Produces a tender, sturdy, non-soggy base that holds fillings well. Avoid overworking, the goal is distinct pieces of fat suspended in flour, not a paste.
6. Add the cold water. Mix gently until the dough just comes together into a cohesive mass. It should be slightly shaggy but hold together when pressed.
7. For a 10-inch pan, use 10 ounces of dough per shell. For pre-baked or frozen shells, use 1 ounce of dough per inch of pie diameter.
8. Pat or roll the dough into disks, cover, and refrigerate for 15 minutes.
9. Roll out the dough on a lightly floured surface to the desired thickness. Fit the dough to the prepared pie pan.
10. Bake in the preheated oven until the crust is golden brown, 25 to 35 minutes.
11. Fill according to your recipe. For pre-baked shells, allow the crust to cool slightly before adding the filling. Pre-baked shells do not need refrigeration before use unless the filling requires it.

BISCUITS

Yield: 3 dozen

Ingredients	Amounts
Flour, bread	1 lb.
Flour, pastry	1 lb.
Sugar, granulated	4 oz.
Baking powder	3 Tbsp.
Salt, kosher	2 tsp.
Butter, unsalted, cut into bits	5 oz.
Egg, whole	3 ea.
Buttermilk	15 oz.
Egg, whole	1 ea.
Cream, heavy	1 Tbsp.
Salt, kosher	⅛ tsp.

Method

1. Preheat oven to 425°F.
2. In a large bowl, place the bread flour, pastry flour, sugar, baking powder, and salt. Mix briefly to distribute evenly.
3. Add the cold butter. Using your fingertips, rub the butter into the flour until it resembles coarse meal or crumbs. There may be some pea-sized pieces of butter remaining.
4. In a medium bowl, lightly beat the eggs. Add the buttermilk. If the dough seems a little dry, add 1 tablespoon of buttermilk at a time until the correct consistency is achieved.
5. Add the mixture to the dry ingredients. Stir gently with a spatula until a shaggy, slightly sticky dough forms. Avoid overmixing.
6. Turn the dough out onto a lightly floured work surface. Gently pat or roll the dough to ½-inch thickness.
7. For the first fold, fold the dough into thirds, like a letter. Rotate the dough 90 degrees.
8. Roll out the dough to ½-inch thick. Fold the dough into fourths. Turn the dough 90 degrees. Repeat this step 3 times. The dough should be layered but still soft, with visible butter pockets.
9. Roll out the dough to 1-inch thick. Cut the dough with a sharp knife or round biscuit cutter. Avoid twisting the dough.
10. Arrange the biscuits on a parchment-lined sheet tray leaving a little space between them.
11. For the egg wash, in a small bowl, whisk together the egg, cream, and salt. Brush the top of the biscuits with the egg wash.
12. Bake in the preheated oven until golden brown, 20 to 22 minutes.

Variation: For flavored biscuits, cheese, ham, or chopped herbs can be added when the eggs and buttermilk mixture is added to the dry ingredients.

SCONES

Yield: four 6-inch rounds, 2 dozen triangle scones

Ingredients	Amounts
Flour, pastry	2 lb. 2 oz.
Sugar, granulated	4 oz.
Baking powder	1 ½ oz.
Salt, kosher	½ oz.
Butter, cold, cut into bits	14 oz.
Egg, whole	2 ½ oz.
Egg, yolk	3 oz.
Cream, heavy	4 ½ oz.
Egg, whole	1 ea.
Cream, heavy	1 Tbsp.
Salt, kosher	⅛ tsp.

Method

1. Preheat oven to 375°F.
2. In a large bowl, place the pastry flour, sugar, baking powder, and salt. Mix briefly to combine.
3. Add the cold butter. Using your fingertips, rub the butter into the flour until it resembles coarse crumbs. Some pea-sized pieces of butter may remain.
4. In a separate large bowl, place the eggs, egg yolks, and cream. Whisk to combine.
5. Pour the wet ingredients into the dry mixture. Gently stir with spatula until the dough just comes together. Avoid overmixing. The dough should be soft but slightly shaggy.
6. Add any desired flavoring extras. Mix to incorporate.
7. Turn the dough out onto a lightly floured surface. Pat or roll the dough into a rectangle approximately ¾-inch thick. Chill for 10-15 minutes to firm up the butter and improve flakiness.
8. Cut into triangles, rounds, or squares. Transfer to a parchment-lined sheet tray.
9. For the egg wash, in a small bowl, whisk together the egg, cream, and salt. Brush the dough lightly with the egg wash.
10. Bake in preheated oven until golden brown on top with slightly crisp edges, 15 to 20 minutes. Let cool slightly before serving.

Variations: Extras such as dried fruit, chocolate chips, nuts, or zest can be folded into the mixture before the dough is turned out onto a worksurface:
Cherries: 12 oz. pitted fresh or frozen cherries
Ham and Cheese: 12 oz med diced ham, 8 oz shredded Sharp Cheddar
Apple Walnut Cinnamon Scones: 12 oz. diced apples, 6 oz. walnuts, ½ oz. cinnamon
Cranberry Orange Scones: 12 oz. dried cranberries, 1 oz. orange zest

DAY THREE: PIE FILLINGS, INTRODUCTION TO BREADS AND ENRICHED YEAST DOUGHS

LEARNING OBJECTIVES

By the end of this day, you should be able to…

- explain the role of fat in an enriched dough.
- explain the term "enriched" as it applies to yeast doughs.
- explain why some enriched doughs are rested overnight.
- determine the proper time to add the fat to an enriched dough during the mixing process.

LEARNING ACTIVITIES

- Lecture/ Discussion
- Demonstrations
- Hands-On Production
- Product Evaluation

KEY TERMS

- Enriched
- Gliadin
- Gluten
- Glutenin

PIE FILLINGS

Pie fillings can be divided into three main categories based on their ingredients and how they are handled. These three types include fruit, custard, and cream. Understanding these categories and their guidelines will allow you to always know how to properly handle and bake any variety of pie.

FRUIT PIE FILLINGS

Fruit pie fillings can be divided into two categories: **pre-cooked** and **uncooked**. These names refer to the way the fillings go into the shells, not the way they are served. The advantages of the pre-cooked filling method are that the filling can be made in quantity and then placed into pie shells and baked as needed. Additionally, pre-cooked fillings are easier for the baker to control and adjust for differences in fruit. If a batch of fruit is particularly tart, the baker can easily compensate by adding more sugar to taste. The same is true of the liquid content of the fruit that can be compensated for by altering the starch in the filling. In using the uncooked method, such variations would not be discovered until after the pie is baked. Finally, due to the filling being pre-cooked, the baking time is greatly reduced in pre-cooked fillings.

When using the **uncooked** pie filling method, raw fruit, sugars, spices, binder, and usually a type of starch are combined in a bowl. That mixture is then deposited into unbaked pie shells, topped with a crust or a crumb topping, and the pie is baked. Because the binder is a starch, it is imperative to bake this type of pie until the center of the filling comes to a boil to gelatinize the starch, thicken the filling, and remove any starchy flavor. Because of this need, these pies are typically baked at a slightly lower temperature than pre-cooked filling pies are so that the filling boils at the same time the crust reaches a golden-brown color.

To produce **pre-cooked** pie fillings, liquids such as juice or water are boiled with sugar. A starch slurry is then added, and the mixture is returned to a boil to cook the starch, thus thickening the juice. The fruit is then added, and depending on the formula, may be returned to a boil or not. This pre-cooked mixture must be chilled before pouring into the shells and may be stored for several days in the refrigerator. Before baking, the pie is topped with a crust or crumb topping. These pies are typically baked at a high temperature for a shorter period to bake and caramelize the crust without boiling the filling.

CUSTARD-TYPE PIE FILLINGS

Any mixture that contains uncooked eggs and thickens through the baking process can be considered a custard-type pie filling. Pecan pie, pumpkin pie, and quiche are all classic examples. To prepare, the pie filling is generally poured into an unbaked shell then placed into a very hot oven for a short period to allow the crust to bake. Once the crust has browned, the temperature is reduced to moderate heat and the pie is left to slowly continue baking until the custard is just set. If the custard should over-bake it will take on a curdled texture and will cause cracks to form on the pie's surface. Mealy pie dough is preferred with this type of filling as the finely distributed fat coats the flour and prevents it from soaking up excessive liquid thus preventing a soggy crust.

CREAM-TYPE PIE FILLINGS

Cream-type pies encompass a wide variety of fillings. The common denominator among them, however, is that the filling is always poured into a pre-baked shell, and the pie is not further baked. Examples of cream-type pie fillings include banana cream, chocolate cream, lemon meringue, and chiffon pies. In each of these varieties, the filling contains some type of binding agent that causes the filling to set with no further baking required. In the case of cream pies and lemon meringue filling, the starch cooked with the filling sets into shape as it cools. Therefore, it is critical to pour these fillings into the pre-baked shells while the filling is hot. In the case of chiffon pies, gelatin is used as the binding

agent, and the filling must be poured into the pre-baked shell before the gelatin has a chance to set.

Finishing Pies

The treatment to the top of a pie or tart makes it more interesting and appealing. Streusel or crumb crusts are appropriate for fruit pies. They are quick and easy and add flavor and texture. Pastry is a more versatile crust and is also appropriate for fruit pies. A pastry top for a pie may be made to completely cover the pie or tart or may be cut into strips and woven over the top to create a lattice pattern. Cut vents into the pastry if it covers the entire top. This will allow steam to escape during baking allowing the top crust to bake crisp, flaky. Cut pastry dough into shapes and use them to adorn the top of a pie or tart.

Enriched Bread Doughs

In addition to the ingredients found in a lean dough (flour, water, yeast, and salt), enriched doughs include the addition of fat, eggs, and sugar. Let's look at how these additions affect the final product.

Fats and Oils

Fats and oils may be added for flavor and to enrich the bread. Fat softens the gluten and makes closer-textured, moister loaves. Some of the other important functions of fats and oils are:

- to tenderize products through disruption of gluten development
- to provide moisture and texture – thus enhancing palatability and shelf life
- to provide satiety and satisfy the consumer (nine calories per gram of fat)

Sugars

While sugar sweetens bread, it also makes the texture tender by softening the gluten. Sugar also gives the loaf a browner crust. A little sugar added to bread dough accelerates the yeast's action, but high concentrations of sugar can kill the

yeast. It should be kept in mind that both wild and commercial yeasts obtain needed sugars by converting the starch in the grain into simple sugars, and it is not necessary to add granulated sugar to bread doughs to obtain a good finished product. Sugars perform a variety of functions in bread baking. Some of the most important functions are:

- to provide sweetness
- to soften the texture of baked goods by delaying gelatinization of starches and denaturing gluten
- to act as a food supply to yeast – in controlled amounts it can help fermentation
- to disrupt yeast growth by drawing water out of the yeast cells and by causing yeast to develop too quickly and drown in its own waste (requires large quantities of sugar)
- to slow the development of gluten--sugar in a bread dough takes water away from the gluten developing proteins
- for caramelization – it browns and forms a crisp outer crust. Caramelization of pure, white sugar begins at 300°F
- to attract and absorb moisture from other ingredients and thus delay drying of the end product, allowing it to keep a fresher texture for longer

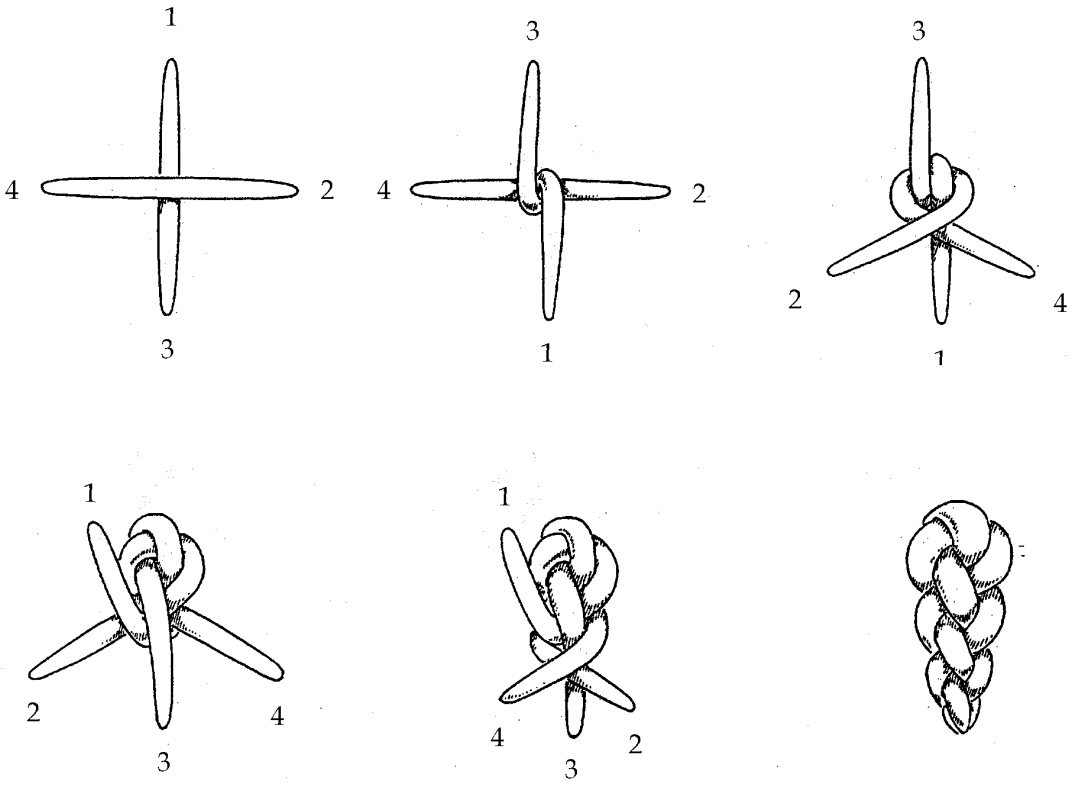
EGGS

Eggs add flavor and color to bread and contribute to the leavening process. A glaze of egg bakes golden (like a layer of varnish) and gives a more tender crust. Some of their most important functions are:

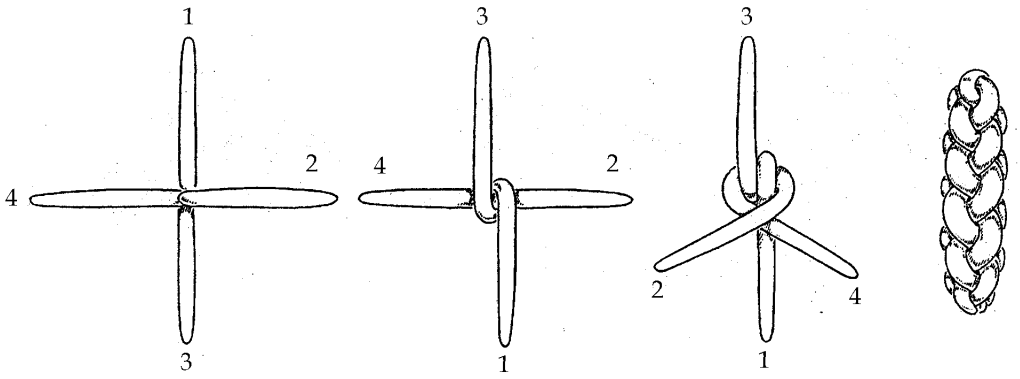
- to act as binders and emulsifiers, helping to hold other ingredients in mixture together
- to act as shortening, fat in yolk tenderizes product
- to add flavor – combine with sweet and savory flavors well
- to add color – natural color of yolk for interior of product, browns well for exterior finish

Shaping Challah

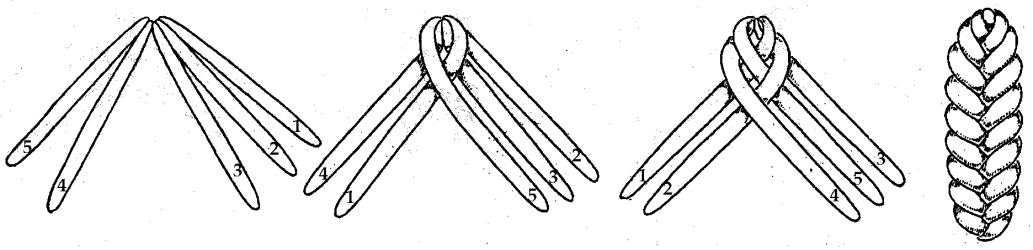
Two Strand Braid



Four Strand Braid



Five Strand Braid I



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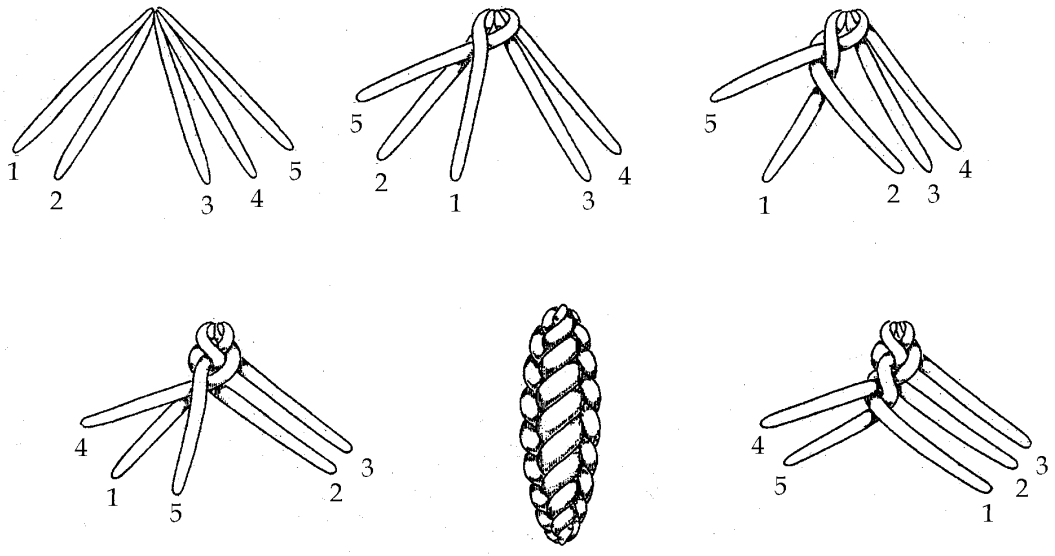
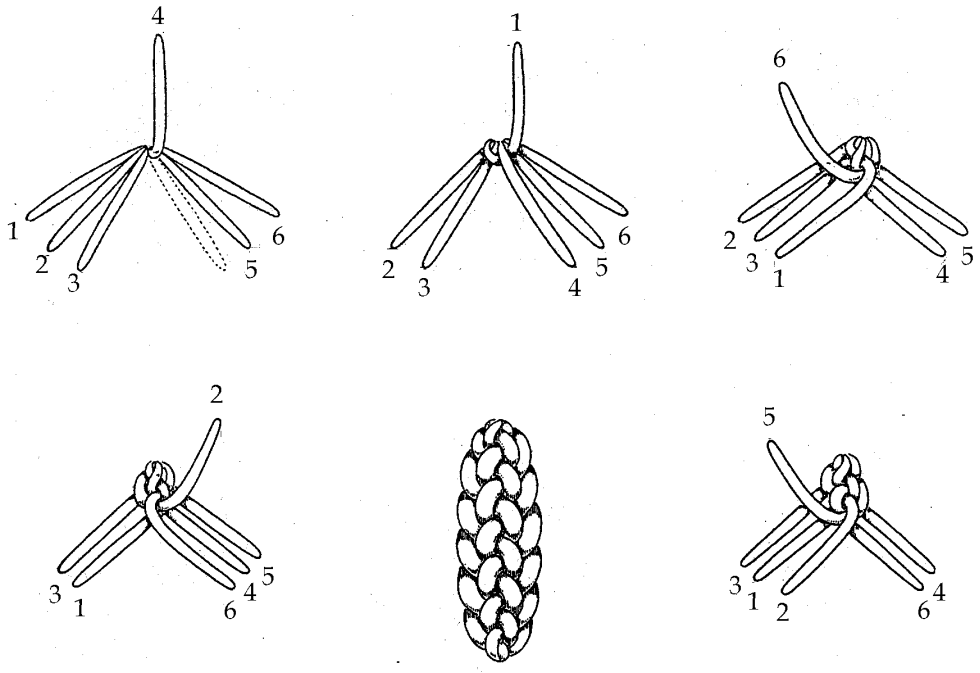


SIX STRAND BRAID



DAY THREE: TEAM PRODUCTION ASSIGNMENTS

ALL TEAMS:

Challah

TEAM ONE:

Apple Pie

TEAM TWO:

Cherry Pie

TEAM THREE:

Pecan Pie

TEAM FOUR:

Chocolate Cream Pie

TAKE HOME RECIPES:

Lemon Meringue Pie

PREP FOR DAY FOUR:

Ciabatta Poolish

CHALLAH

Yield: 2 loaves

Ingredients	Amounts
Water	1 lb. 8 oz.
Yeast, dry, instant	¾ oz.
Flour, bread	4 lb. 2 oz.
Sugar, granulated	6 oz.
Salt, kosher	1 oz.
Egg, yolk	12 oz.
Oil, vegetable	6 oz.
Egg, whole	1 ea.
Water	1 Tbsp.
Salt, kosher	⅛ tsp.
Cornmeal	as needed

Method

1. Preheat oven to 390°F. Sprinkle a sheet pan with cornmeal. Reserve.
2. In the bowl of a stand mixer fitted with the dough hook attachment, place the water, yeast, bread flour, sugar, salt, egg yolks, and vegetable oil. Mix until the dough is smooth, elastic, and slightly tacky, about 12 minutes.
3. Perform the windowpane test: pull the dough until it is thin enough for light to be seen through it. If the dough passes this test, it indicates that the gluten has developed sufficiently, allowing for a smooth and elastic dough. (See Chef demo.)
4. Transfer the dough to a lightly oiled bowl. Cover and bulk ferment until it doubles in size, about 1 hour
5. Punch down the dough gently. Divide into portions as needed for braiding.
6. Cover the bowl and let the dough ferment for 20 minutes to relax the gluten.
7. Divide each portion into smaller pieces. Roll the dough into strips of even length and thickness. Perform a six-braid. (See Chef demo.)
8. Transfer to the prepared sheet pan. Cover the pan and let it pan ferment until puffy, about 30 minutes.
9. For the egg wash, in a small bowl, whisk together the egg, water, and salt. Brush the egg wash on the challah.
10. Bake in the preheated oven until the loaves are deep golden brown and sound hollow when tapped on the bottom, 25 to 30 minutes.
11. Transfer to a wire rack. Cool before slicing.

APPLE PIE

Yield: four 9-inch pies

Ingredients	Amount
3-2-1 Pie Dough (See prior recipe)	3 lb.
Apple, Granny Smith	4 lb.
Apple, Golden Delicious	4 lb.
Sugar, granulated	1 lb. 2 oz.
Sugar, brown	8 oz.
Cornstarch	5 oz.
Cinnamon, ground	1 Tbsp.
Nutmeg, fresh, grated	½ tsp.
Lemon, juice, fresh	1 oz.
Butter, unsalted, cubed (Divided)	2 oz.
Egg, whole	1 ea.
Water	1 Tbsp.
Salt	⅛ tsp.
Sugar, coarse	as needed
Nutmeg, fresh, grated	as needed

Method

1. Preheat oven to 375°F.
2. Prepare four 9-inch shells. Reserve.
3. For the filling, peel and core the apples. Slice ¼-inch thick.
4. In a large bowl, place the sugar, brown sugar, cornstarch, cinnamon, and nutmeg. Mix well to combine.
5. Add the apples. Toss to coat evenly with the mixture.
6. Add the lemon juice. Mix until evenly coated.
7. Divide the filling evenly between pie shells. Dot each pie with ½ ounces of butter.
8. Add the top crust. (See Chef demo.)
9. For the egg wash, in a small bowl, whisk together the egg, water, and salt. Brush the crust with the egg wash. Sprinkle with the coarse sugar and nutmeg.
10. Bake in the preheated oven until the filling bubbles and the crust is golden-brown, about 55 minutes.

CHERRY PIE

Yield: four 9-inch pies

Ingredients	Amount
3-2-1 Pie Dough (See prior recipe)	3 lb.
Cherry, juice (Divided)	2 lb. 10 oz.
Sugar, granulated	1 lb.
Salt, kosher	¼ tsp.
Clear gel	4 oz.
Cherries	4 lb. 8 oz.
Lemon, juice, fresh	2 Tbsp.
Egg, whole	1 ea.
Water	1 Tbsp.
Butter, unsalted, melted	2 Tbsp.
Egg, whole	1 ea.
Cream, heavy	1 Tbsp.
Salt, kosher	⅛ tsp.

Method

1. Preheat oven to 420°F.
2. Prepare 4 unbaked, fluted shells. Reserve.
3. In a medium saucepan, place 2 lb. 4 oz. of the cherry juice and the sugar and salt. Bring it to a boil.
4. In a small saucepan over medium-low heat, place the remaining 6 ounces of cherry juice and the clear jell. Heat until dissolved. slowly add it to the cherry-sugar mixture.
5. Bring the cherry mixture back to a boil. Cook until mixture becomes clear, about 5 minutes. Remove from the heat.
6. Using a wooden spoon, gently fold in the cherries and lemon juice. Cool.
7. Scale 2 lb. of filling per pie. Add a top or lattice crust. (See Chef demo.)
8. For the egg wash, in a small bowl, whisk together the egg, cream, and salt. Brush the pies with the egg wash mixture.
9. Bake in the preheated oven until the filling sets and the crust browns, about 45 minutes.

Note: Cornstarch can be substituted for the clear gel.

PECAN PIE

Yield: four 9-inch pies

Ingredients	Amounts
3-2-1 Pie Dough (See prior recipe)	3 lb.
Pecans	1 lb. 11 oz.
Sugar, granulated	3 oz.
Flour, bread	3 oz.
Corn syrup, dark	4 lb. 8 oz.
Egg, whole	14 ea.
Vanilla, extract	1 Tbsp.
Salt, kosher	1 tsp.
Butter, unsalted, melted	5 oz.

Method

1. Preheat oven to 450°F.
2. Prepare four unbaked, fluted pie shells.
3. In a dry, medium skillet over medium heat, place the pecans in an even layer. Toast, stirring frequently, until golden brown and aromatic, 3 to 5 minutes. Transfer to a small bowl. Cool.
4. Place 7 ounces of the toasted pecans in each shell. Reserve.
5. In a large bowl, place the sugar and flour. Mix to combine.
6. Add the corn syrup, eggs, vanilla, and salt. Mix until incorporated.
7. With a spatula, gently stir in the melted butter.
8. Scale 1 lb. 12 ounces of filling per pie. Pour the filling over the pecans.
9. Bake in the preheated oven until the crust browns, about 25 minutes.
10. Lower the oven temperature to 325°F. Bake until the filling sets, about 20 minutes.

Variations

Pecan Cranberry Pie: Add 5 oz. of fresh or frozen cranberries with the pecans.
Chocolate Pecan Pie: Add 6 oz. of chocolate chunks with the pecans.

CHOCOLATE CREAM PIE

Yield: four 9-inch pies

Ingredients	Amounts
3-2-1 Pie Dough (See prior recipe)	3 lb.
Milk, whole (Divided)	3 qt.
Sugar, granulated (Divided)	1 lb. 8 oz.
Cornstarch	8 oz.
Egg, whole	12 oz.
Egg, yolk	8 oz.
Chocolate, bittersweet	12 oz.
Vanilla, extract	6 oz.
Butter, unsalted	4 oz.
Heavy cream, whipped	as needed

Method

1. Preheat oven to 400°F.
2. Prepare the Pie Dough recipe. Blind bake the pie shells until golden brown. Cool and reserve.
3. For the filling, in a large saucepan, place 2 ⅔ quarts of the milk and 12 ounces of the sugar. Bring it to a boil.
4. In a large bowl, place the remaining milk and sugar and the cornstarch. Mix to combine.
5. Add the eggs and egg yolks.
6. Temper the egg mixture into the hot milk. Bring the entire mixture to a full boil for 1 minute.
7. Remove the custard from the heat. Add the chocolate, vanilla extract, and butter.
8. Strain the mixture and pour it into the prepared shells. Cover to prevent a skin from forming. Let it cool.
9. Whip the cream to medium-stiff peaks. Transfer the whipped cream to a piping bag. Top the pie with whipped cream. (See Chef demo.)

LEMON MERINGUE PIE

Yield: four 9-inch pies

Ingredients	Amounts
3-2-1 Pie Dough (See prior recipe)	3 lb.
Butter, unsalted	1 lb. 12 oz.
Sugar, granulated	1 lb. 8 oz.
Lemon, juice, fresh	1 lb. 12 oz.
Lemon, zest	4 tsp.
Egg, yolk	36 ea.
Egg, white	1 lb.
Sugar, granulated	1 lb. 8 oz.
Cream of tartar	⅛ tsp.

Method

1. Preheat oven to 400°F.
2. Prepare the Pie Dough recipe. Blind bake the pie shells until golden brown. Set them aside to cool.
3. For the filling, in a large saucepan, place the butter, sugar, juice, and zest. Bring it to a gentle boil.
4. In a medium bowl, place the egg yolks. Whisk some of the heated butter mixture into the yolks to temper them. Add the tempered yolks to the saucepan with the butter mixture.
5. Bring the mixture to a full boil, stirring constantly with a whisk.
6. Pour the hot filling into the pre-baked pie shells. Cover and let it cool overnight.
7. For the meringue topping, in a small bowl, place the egg whites, sugar, and cream of tartar. Mix to combine. Heat over a double boiler.
8. Transfer the mixture to the bowl of a stand mixer fitted with the whip attachment. Whip until stiff peaks form.
9. Top each pie with the meringue, covering the entire surface.
10. Use a blowtorch to caramelize the meringue until it is light golden brown in color.

DAY FOUR: LEAN DOUGHS

LEARNING OBJECTIVES

By the end of this day, you should be able to…

- list the four ingredients found in bread made from lean dough and explain the function of each ingredient.
- outline the twelve steps in bread production.
- apply the straight dough mixing method to produce a standardized product.
- assess the quality of bread.

LEARNING ACTIVITIES

- Lecture/ Discussion
- Demonstrations
- Hands-On Production
- Product Evaluation

KEY TERMS

- Bench rest
- Fermentation
- Fold-over
- Gliadin
- Gluten
- Glutenin
- Proof

STEPS IN BREAD AND ROLL PRODUCTION

TWELVE STEPS IN BREAD PRODUCTION

- Scaling
- Mixing
- Bulk Fermentation
- Folding-over
- Dividing
- Pre-shaping
- Bench Rest
- Shaping
- Final Fermentation
- Scoring
- Baking
- Cooling

SCALING

- Consistent production of the required quantity (varying ingredients may result in too large or too small a quantity)
- Consistent quality
- Uniformity regardless of changes in mixing personnel
- Uniformity in fermentation times
- Controls costs

MIXING

- Brings about a uniform mixture of ingredients
- Develops the gluten in the dough mass to promote the elasticity of the dough and to permit it to retain the gases formed by the yeast
- Distributes the yeast cells uniformly so that they will receive proper nutrition

The average desired dough temperature for most yeast bread doughs is 80°F. but can fall between 65°F. and 85°F. The DDT can be lowered or increased based on the rate of fermentation that is desired. A lower temperature can withstand longer fermentation time, while a higher temperature is used for fast fermenting doughs. Once a DDT is chosen, it must be applied to the total temperature factor. The TTF is calculated by multiplying the DDT times the major factors involved. For straight

dough mixing, three factors are considered (x 3). For the use of a sourdough or pre-fermented dough, one additional factor can be applied for each (x 4 or x 5). After the TTF is achieved, the sum of the known temperatures is subtracted from the TTF. The remaining amount equals the water temperature. When mixing is complete, the dough temperature should fall very close to the DDT.

STAGES OF MIXING

- Pick-up period: the ingredients are combined into a wet, sticky mass
- Clean-up period
- Development period: elasticity starts and the dough begins to pull away from the sides of the mixing bowl
- Final gluten development--the dough is smooth, dry, and elastic and leaves the sides of the bowl completely clean.

ADVANTAGES OF CORRECT MIXING

- Optimum Absorption
- Good Gluten Development
- Slightly Shorter Fermentation Time
- Good Volume
- Good Internal Qualities
    - Thin Cell Wall Structure
    - Silky Smooth Texture
    - Good Keeping Quality

DISADVANTAGES OF IMPROPER MIXING

- Low Absorption
- Lack Of Dough Elasticity
- Somewhat Wet, Sticky Dough
- Irregular Dough Condition
- Low Volume
- Poor Internal Qualities

- Thick Cell Wall Structure
- Streaked Crumb
- Harsh Texture
- Poor Keeping Quality

BULK FERMENTATION

Fermentation starts after the dough has been mixed and continues until it reaches a temperature of 138°F. At this point the yeast is killed and fermentation ceases. The most favorable temperature in which fermentation can take place is 76 to 82°F. The length of the fermentation period depends upon the amount of yeast in the dough and the temperature of the room; the lower the temperature, the slower the fermentation. Dough not sufficiently fermented (under-proofed) is called "young dough." Dough that is over-fermented is called "old dough."

FOUR STAGES OF FERMENTATION

First Fermentation

- Place dough in warm place (80°F) or a humid environment, in a greased bowl covered with a clean cloth, until doubled in size.
- **Fold Over**: The reason for folding the dough is to redistribute the available food for the yeast, equalize the temperature of the dough, and expel the built-up fermentation gases (carbon dioxide and ethyl alcohol).

Second Fermentation

The second fermentation takes place throughout the next three steps:

- **Scaling**: Cutting the dough into portions.
- **Rolling**: Shaping the cut dough into balls, setting aside until all dough has been scaled.
- **Shaping**: Molding the dough into the desired bread or roll shapes and placing in a banneton, on a linen couche, or on a sheet tray.

Third Fermentation

- **Final Floor Fermentation**: Allowing the dough to expand to double its size in a humid environment that prevents the outside from drying out.

Fourth Fermentation

- **Baking**: The dough continues to rise for a last brief period after it is placed in the oven. This is known as oven spring and takes place during the first few minutes of baking until the dough reaches a temperature of 138°F. All the yeast dies after this temperature is reached.

FOLD-OVER

Doughs are folded over when the dough has reached its maximum height, about double in size. This is determined by inserting the fingers to a depth of about four inches. The dough is holding maximum gas if it recedes slowly. It is then ready for the fold-over.

THE OBJECTIVE OF FOLDING OVER

- Expels Gas and Introduces Oxygen
- Move Yeast Cells to New Food Supply
- Equalize Dough Temperature

DIVIDING

Accurate dividing assures correct yields of dough pieces. The speed at which scaling should be done is very important. To avoid over-aging of dough, scaling of dough should be done as quickly as possible.

PRE-SHAPING

During this stage, the dough is given a gentle first shaping. Lay the shaped pieces on the bench in the order they are shaped, in a consistent row. This way, you can return to the first piece when the final shaping takes place.

BENCH REST

During this stage, the pre-shaped loaves relax in preparation for their final forming. Normally this stage lasts from 10 to 20 minutes. It is important to keep the loaves covered with either a plastic sheet or a piece of linen to prevent the formation of a skin on the surface of the bread.

SHAPING

Now the loaves are given their final shaping and placed either on a linen couche, into a banneton, onto a sheet pan, or into a steel loaf pan.

FINAL FERMENTATION

During this stage, the loaves receive their final rising before being loaded into the oven. Again, it is important to ensure that the surface does not form a skin. This can be prevented by using a temperature and humidity-controlled proof box.

SCORING

Almost all breads are scored before being loaded into the oven. Cutting the skin with a razor, sharp knife, or scissors allows for continued expansion of the crumb until the structure is set. It also enables the baker to control the final shape of the bread. When the bread is not scored, not only can the final loaf have a distorted appearance, but also the crust can form too early, which could prevent the bread from achieving its maximum volume. Some breads, like the baguette, have a traditional scoring pattern that doesn't vary. Many other breads are scored in a wide variety of ways; these different types of cuts not only give a different visual aspect to the finished loaf, but are also, in a sense, the baker's "signature."

SCORING IS A NECESSARY PROCESS

- Facilitates oven spring.
- Strengthens the crust's structure.
- Promotes a lighter, more open crumb.

- Releases the excessive buildup of pressure (gases) which can disfigure the shape of the product (strangled).
- Prevents excessive, isolated expansion within the interior structure of the bread that would cause unwanted air pockets under the crust.

BAKING

Baking converts the dough into an edible product and is the culminating act in the process of making bread. Most bread is steamed at the outset of the baking process; this is not true for breads that are egg-washed. The steam gives a final boost of volume known as oven spring. This provides a sheen to the crust, allows for maximum expansion of the bread, contributes to the color of the crust, and benefits the final flavor of the bread. The length of time that bread bakes is determined by various factors such as the weight of the loaf, the type of oven it is baked in (e.g. hearth, rotating, convection, etc.), oven temperature, and humidity.

COOLING

Once the loaves are baked, it is important that they are cooled properly to preserve the integrity of the crust and to ensure that they are not deformed by the weight of other loaves. Allow the bread to have ample space on a cooling rack so that air can freely circulate around them. This will allow the bread to maintain its final structure.

POOLISH, BIGA, AND PÂTE FERMENTÉE

Pre-ferments are a combination of yeast, water, flour, and sometimes salt (pâte fermentée) that are mixed and allowed to ferment in a cool environment. Bakers generally prepare the pre-ferment the day before the final dough is mixed. During the fermentation period, acetic and lactic acids form and contribute to flavor, help the dough to retain moisture, and make the gluten stronger, hence enhancing the bread's final structure. Unlike a sourdough, pre-ferments are less acidic and allow the flavor of the wheat to develop. The three types of pre-ferments that you will encounter in Basic Bread Baking include:

POOLISH

At the beginning of the 19th century, a Polish baker replaced the leaven with a fermented mixture of flour, yeast, and water. He discovered that the bread made with poolish, rather than with natural dough leaven (sourdough) tasted less sour and preserved the natural flavor of the flour. The method made its way to Austria and, by 1840, had also made its way to France where it was used to make *pain viennois*.

To make a poolish, combine equal parts of flour and water with a small amount of yeast. (The resulting mixture will be quite loose and soupy.) The amount of yeast depends on the ambient temperature of the bakery but generally runs from 0.02 to 0.2 ounces per pint. Mix all the ingredients together and allow them to ferment at room temperature until tripled in volume, approximately 2 to 12 hours depending on the season.

BIGA

In Italy, bakers use a pre-ferment known as biga to add flavor and structure to their breads. This pre-ferment is especially important since Italian flours are low in protein. Unlike the poolish, a biga is firm and made with ratios of 50% hydration and 1% yeast. In general, bigas are more stable than a liquid Pre-ferment such as poolish.

PÂTE FERMENTÉE (FERMENTED DOUGH)

Bakers may also use another type of pre-ferment known as pâte fermentée. In this case, the baker will save a scrap of dough from the previous day's batch of dough and add it to the following day's dough. Like the biga and poolish, the pâte fermentée should ferment in a cool environment to prevent over-fermentation.

DAY FOUR: TEAM PRODUCTION ASSIGNMENTS

CHEF DEMO

Lean Dough (Baguettes, Boules)

Ciabatta

Focaccia

ALL TEAMS:

Fill and Finish Pies

Ciabatta

Lean dough and focaccia dough will be prepared by instructor during demo. Students will work hands on with the dough alongside Chef to practice proper handling, shaping, proofing evaluation, and baking.

LEAN DOUGH

Yield: 4 baguettes and 2 boules

Ingredients	Amounts
Flour, bread	4 lb. 8 oz.
Water	2 lb. 14 ½ oz.
Salt, kosher	1 ½ oz.
Yeast, instant (red)	½ oz.

Method

1. Using the Straight Dough Mixing Method, in the bowl of a stand mixer fitted with the dough hook attachment, place all the ingredients. Mix on the 1st speed until the ingredients are incorporated.
2. Mix on the 2nd speed until the dough is smooth, elastic, and slightly tacky, 8 to 10 minutes.
3. Transfer the dough to a large, lightly oiled bowl. Cover and bulk ferment for 30 minutes.
4. With wet hands, hold a section of dough from one side, lift it up, and press it down firmly into the middle. Bulk ferment for 30 minutes.
5. With wet hands, hold a section of dough from one side, lift it up, and press it down firmly into the middle. Bulk ferment for 15 minutes.
6. Scale to the desired weight: 12 oz. for a baguette, 20 oz. for a boul.
7. Pre-shape. Let the dough bench rest, covered, to relax the gluten for 15 minutes.
8. Shape the dough. (See Chef demo.)
9. Transfer the dough to prepared pans roof until slightly puffy, about 30 minutes.
10. Preheat oven to 475°F.
11. Score the top of the dough as desired
12. Bake in the preheated oven with steam until deep golden brown, 20 to 25 minutes.
13. Transfer to wire racks. Cool completely before slicing.

CIABATTA

Yield: six 14-inch loaves

Ingredients	Amounts
Poolish	
Flour, bread	9 oz.
Water	9 oz.
Yeast, Instant dry (red)	⅛ tsp.
Final Dough	
Poolish	1 lb.
Flour, bread	1 lb. 7 ½ oz.
Water	1 lb. 1 oz.
Salt, kosher	¾ oz.
Yeast, Instant dry (red)	1 ¼ tsp.

Method

1. For the poolish, in a large bowl, place the bread flour, water, and yeast. Mix until smooth. Cover and ferment at room temperature overnight until bubbly and aromatic.
2. For the final dough, in the bowl of a stand mixer fitted with a dough hook attachment, place the poolish, bread flour, water, salt, and yeast. Mix on the 1st speed until ingredients are fully incorporated, about 4 minutes.
3. Mix on the 2nd speed until the dough is soft, wet, and elastic, about 2 minutes. At this stage, there is moderate gluten development.
4. Transfer the dough to a lightly oiled container. Bulk ferment for 30 minutes.
5. With wet hands, hold a section of dough from one side, lift it up, and press it down firmly into the middle. Bulk ferment for 30 minutes.
6. With wet hands, hold a section of dough from one side, lift it up, and press it down firmly into the middle. Bulk ferment for 15 minutes.
7. Turn the dough out onto a well-floured surface. Scale as per chef's instructions.
8. Gently pre-shape, handling carefully to preserve gas.
9. For the intermediate fermentation, let the dough rest, lightly covered, for 15 minutes.
10. Shape the chibatta loaves gently, keeping a rectangular form. Place on floured parchment paper. Proof until slightly puffy, about 30 minutes.
11. Preheat oven to 475°F.
12. Bake in the preheated oven with steam until deep golden brown, 20 to 30 minutes.
13. Transfer to wire racks and cool completely before slicing.

FOCACCIA BREAD

Yield: 20 portions

Ingredients	Amounts
Rosemary, finely diced	½ oz.
Thyme, fresh, finely diced	1 oz.
Garlic, minced	1 oz.
Pepper, black, ground	1 oz.
Basil, sweet, finely diced	6 oz.
Water, lukewarm	2 lbs. 3 oz.
Milk, whole, lukewarm	1 lb.
Honey	3 oz.
Yeast, dry	2 oz.
Egg, whole	8 oz.
Oil, olive, pure	4 oz.
Flour, high gluten	6 lbs. 8 oz.
Salt, kosher	1 ½ oz.

Method

1. Preheat oven to 400 F.
2. Lightly oil 4 9x13 quarter sheet pans. Reserve.
3. In a medium bowl, place the rosemary, thyme, garlic, pepper, and basil. Mix well to combine. Reserve.
4. In the bowl of a stand mixer fitted with a dough hook attachment, place the water, milk, honey, and dry yeast. Let it sit until slightly foamy, about 5 minutes.
5. Add the eggs and olive oil.
6. Add the high gluten flour.
7. Add the salt. Mix on low speed (1st speed) just until a shaggy dough forms and ingredients are incorporated, 3 to 4 minutes.
8. Increase to medium speed (2nd speed) and mix until the dough becomes smooth, elastic, and slightly tacky, 5 to 7 minutes. For proper gluten development, the dough should pull away from the bowl but still feel soft and extensible.
9. Add the reserved herb mixture during the final minute of mixing.
10. Transfer the dough to a lightly oiled container. Cover and let it bulk ferment until it has doubled in size, 45 to 60 minutes.
11. Perform one-fold halfway through fermentation to strengthen the dough.
12. Divide the dough into 4 portions. Place them on the prepared sheet pans. Let them rest for 10 minutes.
13. Stretch each portion evenly into the pans. Cover loosely and let it proof until relaxed and slightly puffy, 20 to 30 minutes.
14. Preheat oven to 400°F.

15. Using oiled fingertips, dimple the surface of the dough evenly. Drizzle lightly with olive oil. Allow to proof for 10 to 15 minutes.
16. Bake in the preheated oven until golden brown, fully baked through, and the bottom is light and crisp, 15 to 20 minutes.
17. Remove the focaccia from the pans and cool slightly on wire racks. Serve warm or at room temperature.

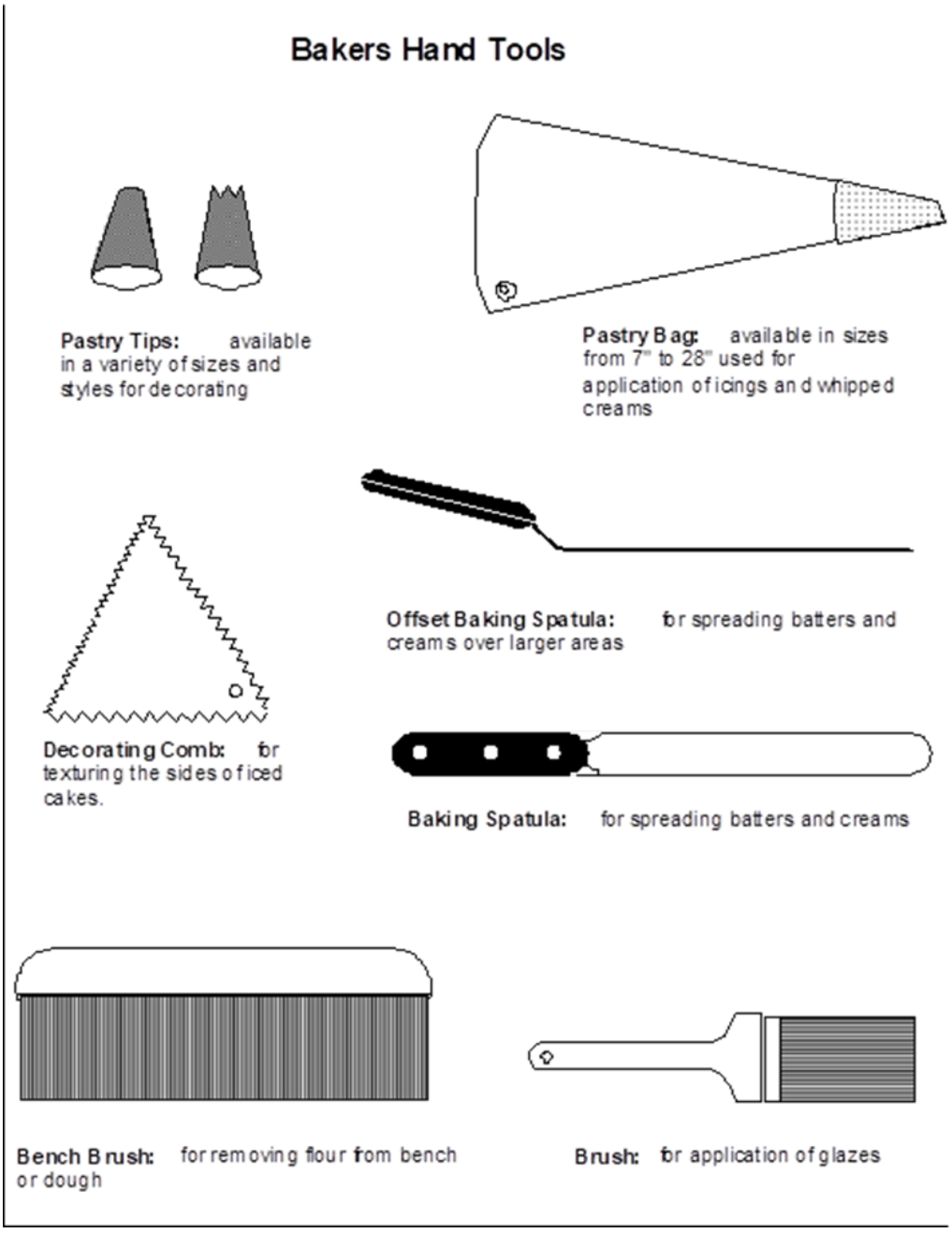
Note: Liquids should be lukewarm, not hot.

RECIPE INDEX

APPENDIX

TOOLS AND EQUIPMENT

The quality of equipment you use for baking has a distinct effect on your results. Always use the right tool for the job.



Bakers Hand Tools

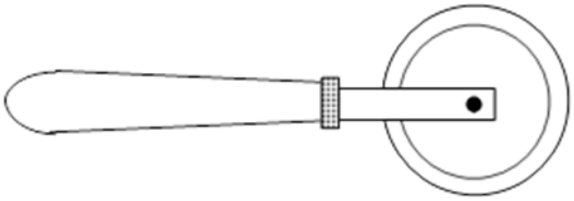
Large Rolling Pin: with ball bearings, for general all purpose rolling of doughs

Pie Pin: used for rolling out smaller amounts of dough

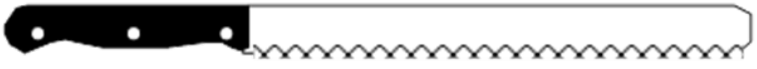
Rubber Scraper: for scraping doughs and batters from mixing bowls

Dough Cutter/Bench Scraper: for cutting doughs and also for scraping wooden benches

Round Cutters: available in sets of graduated sizes and also in fluted styles, for cutting doughs and other pastry products

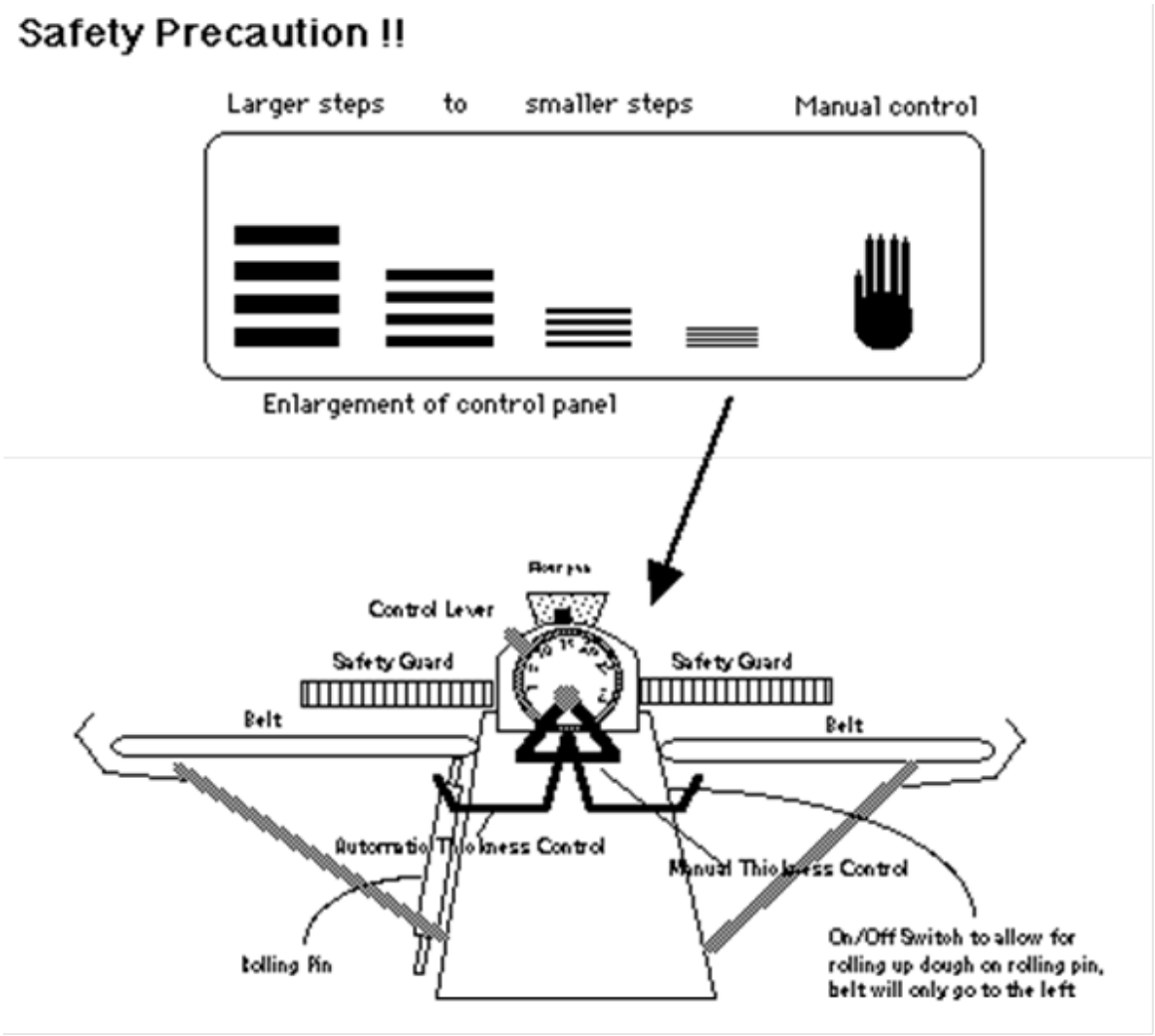


Pastry Wheel: for cutting dough after it has been rolled out



Serrated Slicer: for slicing cakes and breads

HOW TO USE THE DOUGH SHEETER



1) Setting up the machine: fill the flour pan, set the thickness to 30, and open the catch pans.
2) Select the enlargement step: the larger the step, the faster the machine will decrease in thickness.
3) Push safety guards down to position. Push inwards to secure.
4) Procedure for rolling dough:
   (a) Place dough on the right belt.
   (b) Push the handle down and the belt will move dough to left through the rollers on the left belt.
   (c) Pull the handle level to stop the belt.

SCALES

Scales can accurately measure both dry and liquid ingredients. In fact, due to their high level of accuracy, baking and pastry chefs prefer using scales to cup or volume measurers, which is why recipes (or formulas) are typically listed in weight measurements. When you weigh ingredients, be sure to take the measure of the ingredient only, and not the container holding the ingredient as well. Set and empty container on the scales, then set the scale to zero before adding the ingredient to be weighed.

HOW TO USE A BAKER'S BALANCE

1. Place the scale on a level table or work surface free of any obstructions.
2. Place a scoop or container on the left platform - this is very important. If placed on the right platform, the ounce measure cannot be used. Balance the scoop or container with a counterweight placed on the right platform.
3. Set the scale for weighing by placing the correct amount of pounds on the right platform and ounces on the ounce bar.
4. Add your desired ingredients until the scale balances.
5. When using the ounce bar to counterweight your container, add the total amount needed to the ounces already used. (i.e. If 3 ounces is used to balance the container and 8 ounces of an ingredient is needed, set the ounce bar at 11 ounces.)
6. When all 15 ounces on the ounce bar are used, add a 1 lb. weight to the right platform and return the ounce measure to zero, so it may be used again.

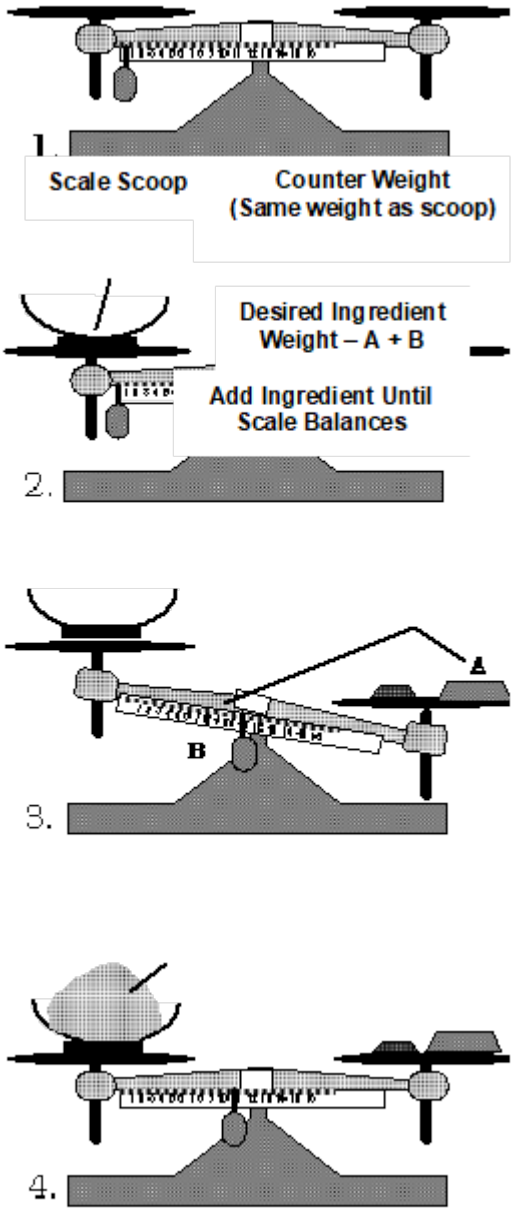
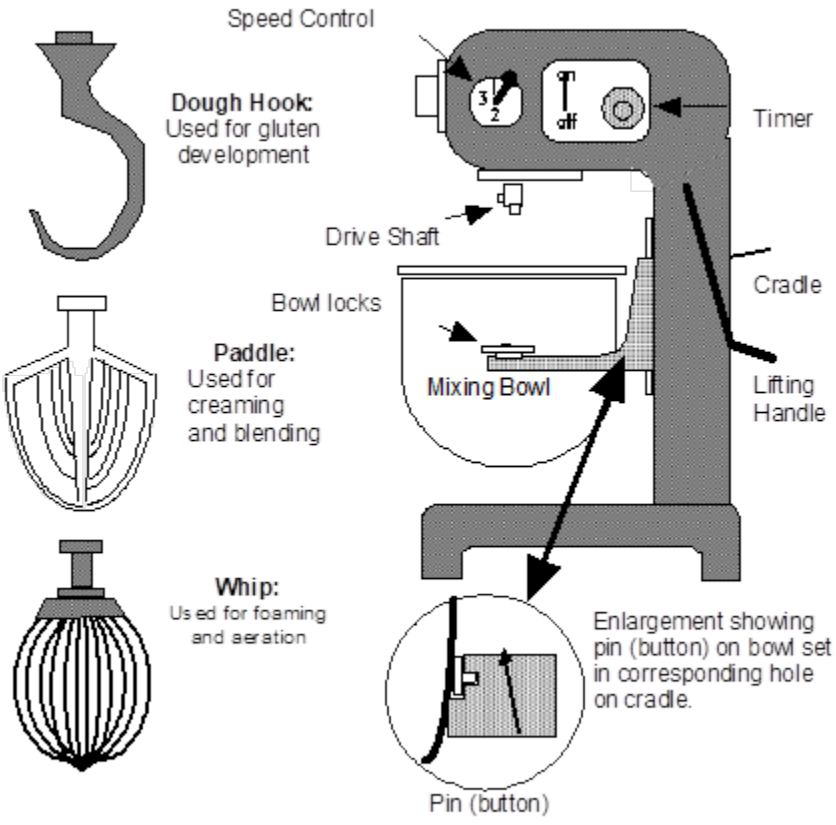


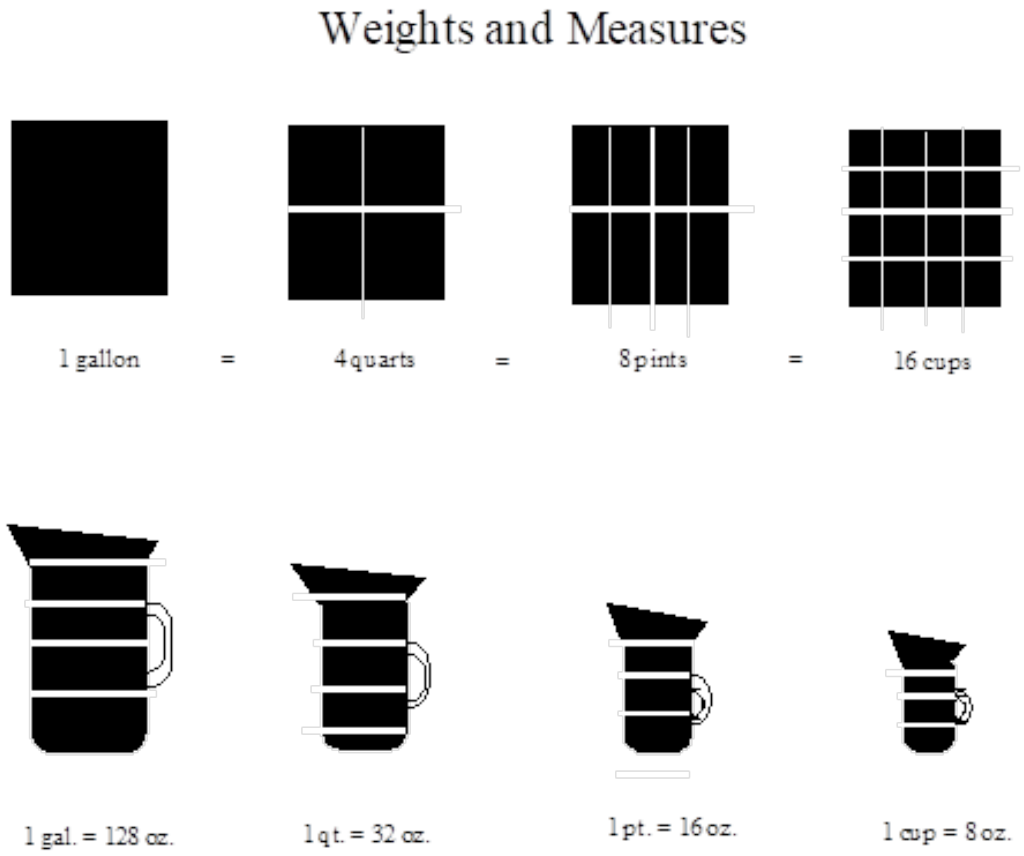
TABLE MIXERS

METHOD FOR USING TABLE MIXER

1. Check to see that the mixer is sitting firmly on a table, power cord is plugged in, timer set on zero, and speed control is set to # 1.
2. Choose the proper size bowl and mixing attachment for the job to be done (check the numbers on each piece; example: 20-quart bowl, 20-quart whip).
3. Lower the cradle to the lowest position with the lifting handle; attach the bowl, being sure that the pin (button) on the bowl is secured in the corresponding hole on the cradle and that the locks are secured on each side of the bowl.
4. Connect attachments to the drive shaft and turn to lock in place.
5. Place the ingredients to be mixed in bowl (be sure the machine is free of all obstructions).
6. Select speed, set timer, and turn on the power.
7. Turn off machine before changing speeds.
8. When done, turn off power, lower cradle, remove bowl and attachments, and return speed to #1. Set the timer back to zero.



WEIGHTS & MEASURES



SCOOP SIZES

#	Approx. Weight		Measure	
30	1 ¼	oz.	2 ⅕	Tbsp.
24	1 ½	oz.	2 ⅔	Tbsp.
20	1 ⅔	oz.	3 ⅕	Tbsp.
16	2 to 2 ½	oz.	¼	cup
12	3	oz.	⅜	cup
10	4	oz.	⅖	cup
8	5	oz.	½	cup

Conversion Tables

Metric Weights and Measures Equivalencies

1 gram (g)	=	1/28 oz. (or 0.035 oz.)
½ ounce (oz.)	=	14 g
1 ounce	=	28.35 g. (approx. 30 g)
2 ounces	=	56 g. (approx. 60 g)
4 ounces	=	110 g
6 ounces	=	170 g
8 ounces	=	225 g
12 ounces	=	340 g
1 pound (16 oz.)	=	453.6 g (454 g)
1 kilogram (kg)	=	2.21 lb.
1 liter	=	35 fl. oz. (1 ¾ pt.)

Metric Conversion Table

To Change…	To…	Multiply by
Pounds (lb.)	Grams (g)	453.6
Ounces (oz.)	Grams (g)	28.35
Pounds (lb.)	Kilograms (kg)	.45
Teaspoons (tsp.)	Milliliters (ml)	5
Tablespoons (Tbsp.)	Milliliters (ml)	15
Fluid Ounces (fl. oz.)	Milliliters (ml)	30
Cups	Liters (l)	.24
Pints (pt.)	Liters (l)	.47
Quarts (qt.)	Liters (l)	.95
Gallons (gal.)	Liters (l)	3.8
Temperature (°F)	Temperature (°C)	5/9 after subtracting 32*

**Example: 9°F above boiling equals 5°C above boiling.*

Temperature Equivalencies

Fahrenheit (°F)	Celsius (°C)	Classification
250	130	very cool
300	150	low
325	165	moderate-low
350	180	moderate
400	200	moderate-hot
425	220	hot
450	230	very hot

US Customary Liquid Volume Conversions

1 tablespoon (Tbsp.)	=	3 teaspoons (tsp.)
1 fluid ounce (fl. oz.)	=	2 tablespoons (Tbsp.)
1 cup	=	8 fluid ounces (fl. oz.)
1 pint (pt.)	=	2 cups
1 pint (pt.)	=	16 fluid ounces
1 quart (qt.)	=	2 pints (pt.)
1 gallon (gal.)	=	4 quarts (qt.)
1 gallon (gal.)	=	128 fluid ounces (fl. oz.)

US to Metric Dry Measures Conversions

tsp.	Tbsp.	oz.	cup	lb.	grams
3	1	½	1/16	---	14
6	2	1	⅛	1/16	28
12	4	2	¼	⅛	57
24	8	4	½	¼	113
36	12	6	¾	⅜	170
48	16	8	1	½	227
96	32	16	2	1	454

Volume Measure Conversions

US	Metric
1 tsp.	5 milliliters (ml)
1 Tbsp.	15 ml
1 fl. oz./ 2 Tbsp.	30 ml
2 fl. oz./ ¼ cup	60 ml
8 fl. oz./ 1 cup	240 ml
16 fl. oz./ 1 pint (pt.)	480 ml
32 fl. oz./ 1 quart (qt.)	960 ml
128 fl. oz./ 1 gallon (gal.)	3.84 liters (L)

Recipe Yield

Original	Cut in Half	Cut in Third
1 cup	½ cup	⅓ cup
¾ cup	6 Tbsp.	¼ cup
⅔ cup	⅓ cup	3 Tbsp. + 1 ½ tsp.
½ cup	¼ cup	2 Tbsp. + 2 tsp.
⅓ cup	2 Tbsp. + 2 tsp.	1 Tbsp. + 1 ¼ tsp.
¼ cup	2 Tbsp.	1 Tbsp. + 1 tsp.
1 Tbsp.	1 + ½ tsp.	1 tsp.
1 tsp.	½ tsp.	⅓ tsp.
½ tsp.	¼ tsp.	⅛ tsp.
¼ tsp.	⅛ tsp.	dash

These materials were developed at the Culinary Institute of America.

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