



# Dough sculpting 102

Volume 49 | Gr. 9–12

Refrigerator potato dough



## Materials list (for each lab or team)

- Home Baking Association *How to Make Soft Pretzels: Dough Sculpting 101* DVD ([WA32838](#))
- Ingredients for refrigerator potato dough
- 5 qt. KitchenAid® Artisan Mixer ([WA22232](#))
- Wilton® Perfect Results Cookie Pan ([WA32716](#))
- Half-size baking pan liner ([WA33722](#))
- Parchment pan liners
- Escali® Ciro Digital Scale ([WA35147](#))
- Stainless steel measuring cup and spoon set ([WA21270](#))
- Digital thermometer ([SB47505](#))
- Ateco bowl scraper ([WA29531](#))
- Plastic wrap [[KI01037\(I\)](#)]
- Pan spray
- Nonstick cooling rack set ([WA28456](#))
- Plastic storage bags ([W00762](#))
- Food wrap/packaging/labels for rolls, loaves
- Refrigerator potato dough recipe handout (p. 3)
- Roll shapes handout (p. 4)
- Local connections handout (p. 5)
- Tips for shaping success handout (p. 6)

## Additional resources

- *A Baker's Dozen Labs* manual ([WA27798](#))
- Commercial examples with prices (sliced bread, rolls, and specialty/artisan rolls, loaves)

## Standards

### NASAFACS

**1.2.1** Analyze potential career choices to determine the knowledge, skills, attitudes, and opportunities associated with each career.

**1.2.4** Demonstrate teamwork skills in school, community and workplace settings and with diverse populations.

**1.3.3** Analyze personal and family assets and skills that provide service to the community.

**8.1** Analyze career paths within the food production and food services industries.

**8.4.7** Apply principles of measurement, portion control, conversions, food cost analysis and control, menu terminology, and menu pricing to menu planning.

**8.5** Demonstrate professional food preparation methods and techniques for all menu categories to produce a variety of food products that meet customer needs.

**14.3.3** Demonstrate ability to select, store, prepare, and serve nutritious, aesthetically pleasing food and food product.

## Objectives

Students will...

- Explore careers in baking production, baking science, or culinary baking
- Calculate the costs of producing potato roll yeast dough
- Identify how much value is added through specialty dough shaping
- Use safe-food preparation and handling techniques for food sales
- Apply professional food preparation techniques, teamwork, portion control, and uniform shaping techniques for aesthetically pleasing products for food sales

## Career & Technology Connections

- Baking Builds STE(A)M PowerPoint® at [HomeBaking.org](#)
- Baking & Pasty, Johnson & Wales University at [www.jwu.edu](#)
- Kitchen Blueprint to Math, Science, Art, and Literacy PowerPoint® for Early Childhood education at [HomeBaking.org](#)

## Career Clusters (& Pathways)

- Food Production and Services

## FCCLA Connections

- Student Body
- Power of ONE/Leadership Service in Action

## Introduction

Dough sculpting with refrigerator potato dough provides the “just like Grandma’s” connection for culinary baking-for-profit products in restaurants or local bakery sales. This dough handles beautifully and may be shaped in short labs or refrigerated for two- or three-day production schedules by following refrigeration techniques. Dough production, time-saving tips, and a wide variety of specialty roll and loaf shapes are demonstrated on the *Dough Sculpting 101* DVD ([WA32838](#)). Additional lab resources are contained on the DVD including specialty cookies, centerpiece display dough sculptures, and Play Clay for early learners. Additional baking science found in the *A Baker’s Dozen Labs* manual ([WA27798](#)). Consult HBA’s Baking Glossary at [HomeBaking.org](#) for additional baking test-kitchen resources and links with baking ingredient and term entries.



## Day 1 – Consumer math & science

### Activity 1: Exploration (10 minutes)

Explore consumer concept of “value-added.” Where do you purchase daily bread products? (Varies — day-old bakery store, supermarket, etc.) How much do you pay for 1 lb./16 oz. packages of buns, rolls, or loaves? (Varies — \$1.89+.) If we baked these in our homes or lab, how much do the ingredients cost? (Generally can make 2+ lbs. of similar product for approximately \$1.75.) What is the advantage of baking for yourself? (Locally made, flavor, control of ingredients, whole grain, variety of grains, freshness, no preservatives, variety of shapes, sizes, etc.) In culinary, what does “value-added” mean? (With a special shape, ingredient, or technique a product gains value in the eyes of the consumer, they are willing to pay more, allowing more profit.) Dough sculpting or specialty shaping “adds value” to a dough.

### Activity 2: Career connections (10–30 minutes)

Explore who needs to know how to prepare a dough — cookie, muffin, yeasted — for a culinary or food career. Will it make you a more valuable employee if you can bake as a part of your culinary skills? Where can you learn baking skills for home and career? Visit websites (see Career & Tech Connections) for PowerPoint® or baking career sites. Careers in baking begin at home, 4-H or FCCLA, culinary classes — and may continue to certification, apprenticeship or to a Ph.D. Baking can take you all over the world.

### Activity 3: Baking prep (20–30 minutes)

Read and assemble recipe ingredients; read each step, assemble equipment, and determine if you know how to use it. As needed, view Refrigerator Potato Dough preparation demonstration on *Dough Sculpting 101* DVD ([WA32838](#)).

### Activity 4: Baking science (15 minutes)

Research what yeast eats at [www.breadworld.com](#) and [www.redstaryeast.com](#). Find essential yeast temperatures in *A Baker’s Dozen Labs* manual ([WA27798](#)).

## Day 2 – Baking lab

### Activity 1: Exploration (20–30 minutes)

Prepare the potato refrigerator dough recipe (p. 3) — either to shape immediately or to refrigerate and shape the next day.



### Activity 2: Exploration (20–30 minutes)

Each team divides/scales one recipe of dough into thirds (1 lb. 4 oz.) or sixths (10 oz.) and shape three to six different shapes rolls using lab diagram directions.

- How to shape rolls is demonstrated on *Dough Sculpting 101* DVD ([WA32838](#)) along with additional braids, loaves, and centerpiece sculptures.
- Bake as directed for the size and shapes selected.
- Cool baked product on wire racks (until 100° F at center), wrap individually or in quantities that will sell or be served.

**Note:** Potato dough products will remain moist for second day serving/sales. Centerpiece sculptures use a plain yeast dough.

Demonstration images taken from *Dough Sculpting 101* DVD.

# Refrigerator potato dough

Dough Preparation Time: 30 minutes      Fermentation Time 1 hour      Baking Time: 10 to 12 minutes  
 Yields: 3 lb. 12 oz. dough. 3 dozen (1.75 oz./48g) rolls; OR three 1.25 lb/565g dough pieces

Ingredients	Measurement	Weight	Bakers %
Unbleached all-purpose flour*	6 ½ to 7 cups	27.5 to 30 oz 780g to 850g	100%
Warm water (95 °F.)	½ cup	4 oz	13%
Active dry** yeast	4 ½ teaspoons (2 pkg.)	0.5 oz/14g	1.5%
Sugar	½ teaspoon	2 g	0.2%
Milk, scalded, cooled (72° F.)	1 ½ cups	12 oz	40%
Butter	½ cup + 2 T.	5 oz/142g	16%
Sugar	½ cup	3.5 oz/100g	12%
Salt	2 ½ teaspoons	0.6 oz/15g	1.75%
Mashed potato, unseasoned***	1/3 cup	3 oz/85g	10%
Whole eggs	2 large or 3 medium	3.5 oz/100g	12%
Citrus zest, optional	1 ½ teaspoons	3g	0.4%

\*For whole grain option replace 4 cups (16 oz.) all-purpose flour with whole wheat flour

\*\*Fast-rising or instant yeast may be used. Combine yeast with flour; combine water and milk (72° F); add together

\*\*\*1 small potato, white, yellow or sweet; cooked, peeled and mashed or equivalent potato flakes or flour

## Directions

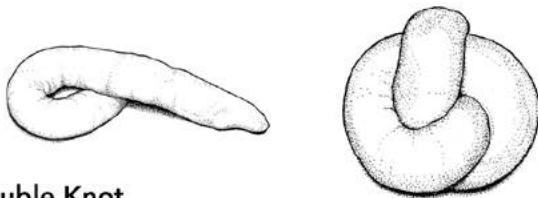
- Mix warm water, yeast and ½ tsp. sugar in small bowl. Set aside 5 minutes.
- Heat milk in microwave until steaming hot (190° F.). Pour milk into large mixing bowl; add butter, ½ cup sugar, and salt; mix. Cool to 80° F. or cooler.
- When milk mixture is cooled, stir in dissolved yeast, mashed potato and eggs. Gradually add 4 cups flour (if using whole wheat flour, add it first). Beat at medium speed 3 to 5 minutes until smooth. Cover bowl and let dough rest 15 minutes.
- Mix in remaining flour until dough forms a rough ball.
- Place dough on lightly floured surface; knead about 10 minutes until smooth and elastic OR mix with dough attachment on medium speed until dough cleans the bowl, about 7-10 minutes. If dough is too dry, mix/knead in 1-2 T. water. Target dough temperature: 78° F. or cooler.
- Place dough into large greased bowl; turn dough; greased-side is up. Cover bowl with sealing lid or put dough in a very large (2 gallon) plastic food storage bag sprayed with vegetable spray. Force out air and seal at top of bag leaving room for dough to raise. (If freezing, divide into three equal discs, wrap as directed p. 134 and freeze.)
- Refrigerate dough, deflating dough after about an hour; round dough into a ball, smooth side up. Refrigerate until ready for shaping; dough will keep in refrigerator one to three days; deflate dough again if needed.
- Divide dough into thirds (1 to 1.25 lb. each) and shape each into a smooth ball. Cover to rest 5-10 minutes.
- Sculpt each 1 to 1.25 lb. piece into... a dozen rolls, a loaf or braid, snail or buns using Dough Shaping 101 guide.
- Follow oven preheating and baking instructions for each product.  
 Loaves, 350° F., 25-30 minutes  
 Rolls, 375° F., 12-15 minutes  
 (190-210° F., at center)

Nutrition Facts	
Serving Size (48g)	
Servings Per Container	
Amount Per Serving	
<b>Calories 120</b>	<b>Calories from Fat 30</b>
% Daily Value*	
<b>Total Fat 3.5g</b>	<b>5%</b>
Saturated Fat 2g	10%
Trans Fat 0g	
<b>Cholesterol 20mg</b>	<b>7%</b>
<b>Sodium 190mg</b>	<b>8%</b>
<b>Total Carbohydrate 20g</b>	<b>7%</b>
Dietary Fiber 0g	0%
Sugars 4g	
<b>Protein 3g</b>	
Vitamin A 2%	Vitamin C 0%
Calcium 2%	Iron 6%
*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs:	
	Calories: 2,000    2,500
Total Fat	Less than 65g    80g
Saturated Fat	Less than 20g    25g
Cholesterol	Less than 300mg    300mg
Sodium	Less than 2,400mg    2,400mg
Total Carbohydrate	300g    375g
Dietary Fiber	25g    30g
Calories per gram:	
Fat 9 • Carbohydrate 4 • Protein 4	

## Single Knot Rolls

1. Cut a one to 1 ¼ lb/565g dough piece into 12 even pieces. Roll each piece into a log roughly 4 inches long.
2. Tie the dough in a simple knot, leaving one end in the center of the top and tucking the other underneath.
3. Place on a lightly greased or parchment-lined baking sheet. Cover, proof and bake as directed p. 138.

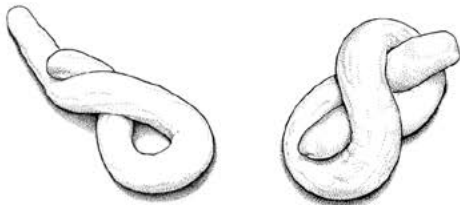
Illustration Source: *The King Arthur Flour Baker's Companion, The Countryman Press, 2003. kingarthurfour.com*



## Double Knot

1. Cut a one to 1 ¼ lb/565g dough piece into 12 even pieces. Roll each piece into a rope 8-inches long. Make a loop with the top half of the dough, giving the closed end a half-inch overlap of dough.
2. Turn this loop over so the long piece is on top. Wind the long piece behind the overlap, and bring the end back up through the loop to make a figure 8.
3. Place on a lightly greased or parchment-lined baking sheet. Cover, proof and bake as directed p. 138.

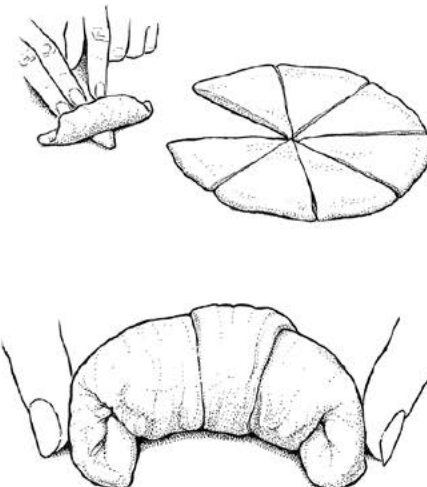
Illustration Source: *The King Arthur Flour Baker's Companion, The Countryman Press, 2003. kingarthurfour.com*



## Rosette

1. Roll a one to 1 ¼ lb/565g dough into a 6 X 12-inch rectangle ½-inch thick. Starting from the 6-inch side, cut into 1-inch wide strips.
2. Roll each strip into a 14-inch rope.
3. Tie in a loose knot, leaving two long ends. Tuck one end under the roll and pinch to seal. Bring the other end up and over the roll and pinch to seal on the underneath side. Leave a small opening in the center of the rosette.
4. Place on a greased or lined baking sheet pan about 2 inches apart. Cover and let proof (rise) until double.
5. Preheat oven to 375° F. and bake 12-14 minutes.

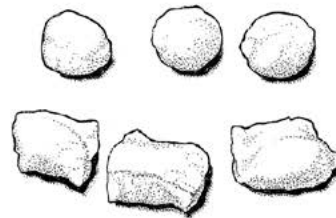
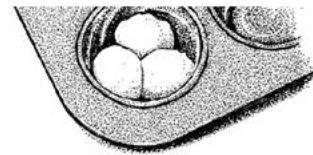
Courtesy of kswheat.com



## Cloverleaf Rolls

1. Shape one to 1 ¼ lb/565g of dough into a log about 3 inches thick. Use a dough cutter to cut log into 12 even (~3 oz/85g) pieces. Weigh a few to check your eye.
2. Divide each of the 12 pieces into three small pieces and roll these into smooth balls.
3. Place the three balls together in greased medium-sized muffin cups. Repeat for 1 dozen. Proof and bake as directed p. 138.

Illustration Source: *The King Arthur Flour Baker's Companion, The Countryman Press, 2003. kingarthurfour.com*



## Butterhorn or Crescent Roll:

1. Roll 1/3 of the dough (1.25 lb/565g) into a large (16-inch) circle, about 1/4-inch thick.
2. Spread thinly with softened butter; cut like a pie into 12 even wedges; roll each wedge up, wide edge to point; place rolls a couple inches apart on greased baking sheet with point underneath. Cover and let rise until double in size. Bake as directed, p. 138.

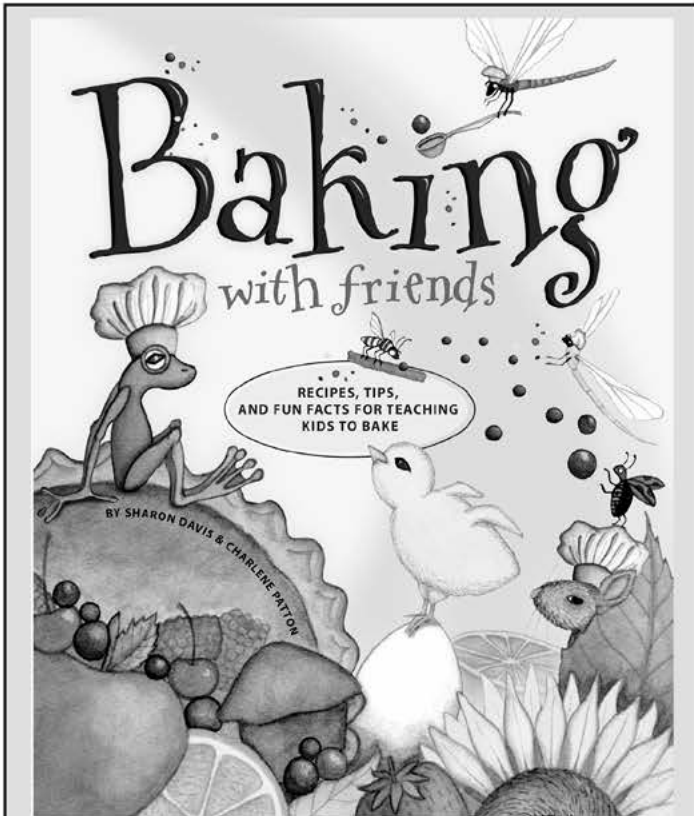
Illustration Source: *The King Arthur Flour Baker's Companion, The Countryman Press, 2003. kingarthurfour.com*

## Local Connections:

### Shape Up! Your Food Enjoyment Factor

Too often food is just something to unwrap, stuff down and run. Adding hands-on food preparation reduces several factors contributing to overweight.

- Preparing food is a great way to get more active. ("Burn and earn" the food you consume!)
- Sharing food often increases enjoyment, improves choices and eating more appropriate amounts.
- Creating aroma, flavor, and eye-appealing food develops satisfaction, self-esteem, self-confidence and relationships that reduce the need to over consume.



ILLUSTRATIONS BY: COLEEN MCINTYRE • EDITED BY: NICHOLAS BEATTY • AUDIO CD: PAMELA ATHERTON

*Baking with Friends*, a guide to reading and baking with young people. Order at [HomeBaking.org](http://HomeBaking.org)

### Double the learning... Book and Bake Enjoy a book while dough rests, rises or bakes.

A few great choices for this lab include:

Preschool-K:

*Bread, Bread, Bread*. Ann Morris and Ken Heyman  
*Little Red Hen and the Ear of Wheat*. Mary Finch.

Early elementary:

*Miss Spider's Tea Party*. David Kirk  
*Walter the Baker*. Eric Carle  
*Bread is for Eating*. David and Phyllis Gershator

Elementary:

*Everybody Bakes Bread*. Norah Dooley  
*The Sleeping Bread*. Stefan Czernecki and Timothy Rhodes  
*Bread Song*. Frederick Lipp  
*Larissa's Bread Book*. Lorraine Johnson-Coleman

Polish skills and share your wealth!! Select a local group with which to conduct a "Shape Up," activity.



## For Teacher:

Remember to check to see if the location center has a kitchen or will bake-off the shapes. If not, place shapes on aluminum pan and cover with plastic bag and send home to bake.

Plan a couple hours to

- "dough sculpt" as a creative hands-on food skill-building opportunity for younger children to learn more about bread and grains
- teach parents as "first teachers" to enjoy this art with their children, adding a book list of great books to read along with shaping and baking
- spend a couple hours with older adults as "dough therapy," talking with and shaping rolls to share at a meal or afternoon coffee or tea break
- "build bonds" between peers or across ages

### Options:

1. If time allows, each person or teams can prepare Bread in a Bag. View Fleischmann's Yeast recipe and instructional video included on DVD or on-line at [breadworld.com](http://breadworld.com).
2. Pre-prepare several batches of Refrigerator Potato Dough, (p.137) in the class lab for the group to divide and sculpt. Before you go to the event, be sure the dough is punched, rounded and refrigerated. The dough will be rested and ready when you arrive!
- Prepare a "Shape Up Baking Kit" –a washable plastic tub with surface and hand-cleaning items, baking pans (as needed), parchment, pan spray, plastic wrap, dough scaper/divider, food thermometer and aprons (disposable aprons are sold on-line for pennies).
3. Work together and prepare the dough on-site by hand, in a bread machine, mixer or food processor, then shape...and make someone's day!

From *Baking with Friends: Recipes, Tips and Fun Facts for Teaching Kids to Bake*

### The Thrill of Skill

#### Age-Appropriate Kitchen Tasks

Let older children help teach younger ones – everyone benefits!

#### 2 years old:

Peel hard-wearing  
Wipe table top  
Play with safe utensils  
Scrub, wash, line, strip, break into pieces  
Move pre-measured ingredients from one place to another  
Add ingredients to a bowl

#### 3 years old: All of the above plus...

Handle dough (single kneading, simple shaping)  
Pour cool liquids into mixture  
Mix dry ingredients with wire whisk or spoon in extra large bowl  
Shake liquids  
Spread soft spreads  
Place things in trays

#### 4 years old: All of the above plus...

Peel loose skinned oranges, hard-cooked eggs  
Form round shapes with dough  
Mash fruits (bananas) or cooked vegetables  
Cut with dull scissors (rip green onions, dried fruits)  
Set table

#### 5 to 6 years old: All of the above plus...

Help measure dry ingredients (1/2, spoon, level)  
Cut with a sharp knife (plastic or stainless steel)  
Use a hand held egg beater or whisk  
Crush crackers in a bag with a rolling pin  
Sprinkle ingredients on salads, cereals, cookies, casseroles

#### 6 to 8 years old: All of the above plus...

Clean surfaces before and after  
Wash fruits and/or vegetables  
Gather ingredients and equipment  
Grease or spray baking pans  
Measure dry ingredients  
Measure liquid ingredients  
Add measured dry and liquid ingredients into mixing bowl  
Learn to crack eggs  
Cut fruit, butter or margarine sticks on cutting board (plastic or table knife)  
Push buttons on blenders, processors with adult  
Knead dough  
Preheat oven (adults help load products in hot oven)  
Wash dishes, put away ingredients or utensils

#### 9 to 12 years old: All of the above plus...

Learn safe knife skills (chopping, dicing, and cutting)  
Handle food equipment safely  
Place oven racks and load oven (while oven is cold)  
Safe operation of electric equipment (mixer, microwave, bread machine food processor, etc.)  
Follow a recipe (measure accurately, prepare a product)  
Read ingredient and food labels  
Safety: handle stove ingredients (finished products)  
Plan and prepare simple meals, snacks  
Clean up (how and what to wash in dishwasher or by hand)

#### 13 years old and up: All of the above plus...

Tasks requiring multiple preparation steps or close timing  
Create new flavor combinations, shapes or decorations  
Plan and prepare whole menus for meals or entertaining  
Make shopping lists and shop for ingredients  
Help younger children learn about food and how to prepare  
Enjoy cooking with peers



Consult *The Thrill of Skill* age-appropriate baking skills list found in *Baking with Friends* OR on-line at [HomeBaking.org](http://HomeBaking.org), Spanish translation also available.

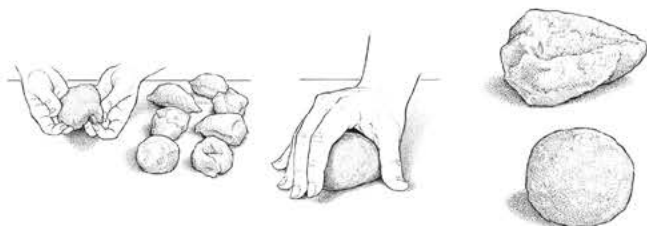
## Tips for Shaping Success

Yeast dough for the shaping artist will:

- have a silky texture, be properly developed—elastic and moist but not “tacky” or too sticky
- place in an oiled, sealed food bag or container, deflated, rounded and rested in refrigerator or at room temperature (68° to 72° F.)
- be relaxed, extensible (can be rolled out or extended without springing back)

To achieve shaping success:

- **Develop the gluten** so the dough cleans the sides of the bowl or counter when mixed or kneaded. The dough should be soft but elastic, cleaning the bowl or kneading surface. Target dough temperature after kneading— 78 - 82° F.—so it will not raise too rapidly, UNLESS you are using a fast-rising yeast method.
- **Use proper fermentation** temperature (78-80° F.) to prevent the dough from over-gassing or getting tacky and help develop the gluten strands further—making the dough easier to shape. (Also see refrigerating dough guidelines, p. 134.)
- **Divide dough evenly** (weigh the dough, divide by number of pieces needed) and round dough to rest. This helps make balanced braids, and equal-sized rolls and loaves.
- **Allow yeast dough to rest**—about 10-15 minutes of bench time after deflating dough, dividing, and rounding. This will make the dough much easier to shape. The dough pieces will be more extensible—not inclined to just rebound back when rolled.
- **Keep the dough pieces covered during bench rest and while shaping to prevent crusting.**
- **Do not over-flour or over-grease the shaping surface.** This leaves a coating of flour or grease on the dough surface and the result will not be as nice in appearance or flavor.
- **Proof bread until ¾ or nearly fully proofed** before egg washing and slashing surface of loaf. (See Ripe Test, HomeBaking.org, Baking Glossary).
- **Preheat oven 5 to 10 minutes** before egg washing or slashing. Oven must be heated to the required temperature when product is ready to bake — never placed in oven.



Source: HomeBaking.org

## Dough Shaping and Sculpting 101

- **Read Tips for Shaping Success** (text box at side).
- **Wash hands and surfaces well.**
- **Select up to three options** to prepare with each third (1.25 lb) of the Refrigerator Potato Dough.
- **Shaping:** Divide Refrigerator Potato Dough recipe (or favorite dough, making 3 to 3.75 lbs) evenly into dough pieces as directed by the option chosen. Place same-sized products on the same pan, spacing as directed.
- **Everyone will want their own edible art...**Tuck a small piece of paper with the baker's initials under the edge of their dough art before baking OR, bake on parchment paper with name noted by the product.
- **Baking:** Cover each pan of shaped dough **lightly** with sprayed or oiled plastic wrap or clean dampened non-terry towel. Place to proof in warm (95-105° F.), draft-free place until double, about 45 minutes. (See Ripe Test, HomeBaking.org in Baking Glossary). Bake rolls as directed. Lay a piece of aluminum foil lightly (tent) on baking dough if edges become too brown. Internal temperature when done is 190-210° F on food thermometer. Cool product on wire racks.



Alligators, Turtles (and more!) at breadworld.com

## Rolls and Critters

**Dinner Rolls:** Bake rolls at 375° F., 12-15 minutes.

1. Shape one third (one to 1.25 lb/565g) Refrigerator Potato Dough into a log about 3 inches thick. Divide into 12 even (~3 oz/85g) pieces.
2. To shape: Flatten dough piece into a disc; bring edges to center and pinch; turn dough over to "round" (see left, middle image) and place pinched edge down on greased baking pan.
3. Cover, proof until doubled in size and bake as directed.

Illustration Source: King Arthur Flour Whole Grain Baking, The Countryman Press, 2006. kingarthurfLOUR.com