

Baking Measurements & Substitutions - English & Metric



Note: Use the text boxes as lab activities. List other reasons for weighing ingredients and batter/dough for portioning them onto pans. (A: Takes less time; less mess; less equipment; more accurate division of batter/dough)

How to accurately measure dry ingredients

- Weighing ingredients is the most accurate method
- If measuring with utensils, always use standard dry measurement cups and spoons.
 - Stir flour, powdered sugar, cocoa etc until light and loose.
 - Sift first if recipe instructs to do so.
 - Use a table spoon to lightly spoon into the cup until it is heaped up above the edge. Don't shake or tap to settle flour.
 - Level off with the straight-edge, not flat side of a spatula.

Weights vs. Measures

The most accurate way to bake is to weigh ingredients

- Professional bakers weigh ingredients.
- In Europe, home bakers weigh ingredients.
- American home bakers measure. How much difference does it make?

- 1) Fill several large containers with flour.
- 2) Have several people measure two cups of the same type of flour.
- 3) Weigh each person's flour in grams.
- 4) How many grams different is each person?

Critical Thinking: *In small quantity home recipes, this may not make as much difference, but what if you were using 5 or more cups of an ingredient? Making hundreds of loaves or muffins in a batch?*

Remember: Each type of flour or ingredient will weigh a different amount per cup. Unless they are "standardized" measuring cups and spoons, they may vary depending on where they are purchased.

Ingredient Weight Equivalents

Stir, spoon and level method of measuring dry ingredients used.

Dry Ingredients

All-purpose flour 1 cup = 4 oz = 112g
 Cake flour 1 cup = 3.75 oz = 105g
 Bran, dry (not cereal) 1 cup = 2 oz = 56g
 Bread flour 1 cup = 4.5 oz = 126g
 Soy flour (defatted) 1 cup = 4 oz = 112g
 Cornmeal 1 cup = 5.33 oz = 150g
 Cocoa (baking) ¼ cup = 1 oz = 28g
 Rolled oats 1 cup = 3.25 oz = 90g
 Dry milk 1 cup = 3.5 oz = 98g
 Granulated sugar 1tsp.=4g 1c.=7oz=196g 1lb.=2c.
 Brown sugar, packed 1cup=7oz=196g 1lb.=2¼cup
 Powdered (6X) sugar, **sifted** 1c=4oz=112g 1lb=4½c
 Raisins 1 cup = 5¼ oz
 Fresh or frozen blueberries 1 cup = 5.25 oz = 147g
 Chopped nuts 1 cup = 3.75 oz = 105g
 Vegetable shortening 1 cup = 6.75 oz
 Butter 1 cup = 8 oz = 2 sticks
 Baking soda 1 tsp. = ¼ oz = 4.7g
 Baking powder 1 tsp. = ⅛ oz = 3.5g
 Salt 1 tsp. = ⅛ oz = 4.7g
 Cinnamon, cloves, nutmeg 1tsp. = ⅓ oz = 2.3g
 Active dry or instant yeast 1pkg. = 2¼ tsp. = 7g

Fluid Ingredients

Honey 1 cup = 12 oz
 Maple Syrup 1 cup = 11.5 oz
 Vegetable oil 1 cup = 7 oz
 Molasses 1 cup = 11 oz
 Water or Vinegar 1 cup = 8 oz
 Milk 1 cup = 8.5 oz
 Whole egg, large* 1 egg = 12/3 oz = 10 per lb.
 Fluid eggs 1 cup = 5 eggs = 8 oz
 Egg white 1 white = 1 oz 8 whites = 1 cup = 8 oz
 Egg Yolk 1 yolk = ~2/3 oz 12 yolks = 8 oz = 1 cup

*Large eggs are standard size used for home baking

Dry Measurement

- Pinch = 1/16 teaspoon
- Dash = 1/8 teaspoon or less
- 1 teaspoon=1/3 tablespoon=5 ml
- 3 teaspoons = 1 tablespoons=15 ml
- 2 tablespoons = 1/8 cup or 1 ounce
- 4 tablespoons=1/4 cup
- 5 tablespoons+1 teaspoon = 1/3 cup
- 10 tablespoons+2 teaspoons = 2/3 cup
- 8 tablespoons = ½ cup
- ½ cup + 2 tablespoons= 5/8 cup
- 12 tablespoons OR ½ c + ¼ c = ¾ cup
- 16 tablespoons = 1 cup
- Zest of ½ lemon rind = 3/8 oz = 1 tablespoon
- Zest of ¼ orange rind = 3/8 oz = 1 tablespoon

Fluid Measurement

- Measure liquids in a liquid measuring cup or beaker
- Set the cup or beaker on a flat surface
- Look at the amount at eye level
- 1 cup = 8 fl.ounces=237 ml
- 2 cups = 1 pint=16 oz= 473 ml (0.473 liters)
- 4 cups = 2 pints = 1 qt = 32 fl. oz.= 946 ml (0.946 liters)
- 4 quarts = 1 gallon
- oz. = ounce or ounces
- c. = cup
- T. = tbsp.= tablespoon
- t. = tsp. = teaspoon
- g = gram or grams=0.035 oz
- lb. = pound = 454 grams
- 1 oz. = 28.35 grams
- 1 liter = 1.06 quarts

Emergency Substitutions

The best ingredient is always the one listed in the recipe or formula.

Ingredients:

Instead of

1 cup all-purpose flour
 7/8 cup all-purpose flour
 1 package active dry yeast
 1 teaspoon baking powder
 1 cup honey
 1 cup butter or sour milk

 1 cup whole milk
 1 tablespoon cornstarch
 1 oz unsweetened chocolate
 6 oz. semi-sweet chocolate chips

 1 large egg
 1 cup all-purpose flour

 1 cup all-purpose flour
 1 cup bread flour
 3 tablespoons of fat
 1 cup sifted all purpose flour
 1 cup brown sugar

Use

1 cup plus 2 T. cake flour
 1 cup cake flour
 2 ¼ teaspoons fast acting yeast OR 1, (½ oz) cake compressed yeast
 1 teaspoon baking soda + ½ teaspoon cream of tartar
 1 ¼ cups sugar or 2 cups powdered sugar + ¼ cup liquid
 1 tablespoon lemon juice or vinegar plus milk to make 1 cup; let stand 5 minutes. OR 1 cup plain yogurt
 1 cup skim milk + 2 tablespoons melted butter or margarine
 2 tablespoons all purpose flour or 4 teaspoons quick cooking tapioca
 3 tablespoons unsweetened cocoa plus 1 tablespoon shortening
 ½ cup + 1 Tbsp unsweetened cocoa plus ¼ c + 3 T. granulated sugar + 4 Tbsp. shortening
 2 egg whites + ½ tsp. vegetable oil OR ¼ cup soft tofu (quick breads, cookies only)
 1 cup whole wheat flour (milled from red or white winter wheat)
 OR 7/8 cup all-purpose flour + 2 Tablespoons soy flour
 ½ cup whole wheat + ½ cup all-purpose flour
 1 teaspoon vital wheat gluten + 1 cup all-purpose flour
 1 1/2 tablespoons of applesauce or prune puree
 7/8 cup unsifted all purpose flour (1/8 cup = 2 Tablespoons)
 1 cup granulated sugar creamed with 2 tablespoons molasses

-**Dutch cocoa** is alkali-processed to be non-acidic. Use when **European unsweetened cocoa** is required.
 -**Soft or reduced margarines** should not be substituted for margarine or butter - they contain more water

Pans

8 ½ X 4 ½ -inch loaf pan

 9 X 2-inch round cake pan
 9 ½ X 2 ½ -in spring form
 10-in X 3½ -in Bundt pan
 13 X 9 X 2-inch pan

 15 X 10 X 1-inch jelly roll pan

Volume

6 cups

 8 cups
 10 cups
 12 cups
 15 cups

Substitute

Three, 5 X 2-inch loaf pans
 Two, 2 ¾ X 1 1/8 -inch muffin tins
 One, 8-inch OR 9 X 1 ½ -in square pan
 9 X 9 X 2 -in square
 Two, 8 ½ X 4 ½ -inch loaf pans
 Two, 9 X 2-inch round pans
 Two, 8X2-inch square pans
 Two, 8-inch round pans

Notes: Medium muffin cups (2¾" X 1 3/8 ") hold a scant ½ cup batter.

A pan's volume is = to the amount of water that fills it to the brim.

Pan dimensions are measured from inside edge to inside edge.

Converting English to Metric

Fahrenheit to Celsius (Centigrade)
 Degrees F. minus 32 X 5 and divide by 9
 Inches to centimeters Inch X 2.54
 Ounces to grams oz X 28.35
 Pounds to kilograms lbs X 0.454
 Cups to milliliters Cup X 236.59
 Pints to liters Pint X 0.473
 Quarts to liters Quart X 0.946

Baker's Challenge: You start baking banana bread but realize you don't have time to bake loaves (takes over an hour). You decide to make muffins instead. How will you decide if you have enough space in the muffins tins, filling each 2/3 full for all the batter? Key: Find the volume of batter you'll have - does the recipe fill one, 9X5 in. pan? OR, how much weight of batter will be used in each pan? Fill the loaf pan as you would with the batter, using water. Use the same water to fill muffin tins 2/3 full to see how many muffins you'll produce. Check a cookbook for baking time and temperatures for similar muffins.

Resources: Take time as a computer lab to visit these sites, taking notes on what each offers.

American Institute of Baking Reference Library. www.aibonline.com

Baking 9-1-1. Rescue from Recipe Disaster. Sarah Phillips. 2003. Fireside Books. www.baking911.com

General Ingredient Transposition Weights (from English measure). American Institute of Baking/Associated Retailer Bakery's of America. Visit RBA www.rbanet.com

Home Baking Association. Glossary and FAQs. www.homebaking.org

The New Food Lover's Companion. Sharon Tyler Herbst. 2nd edition. Barron's Cooking Guide.

Wheat Foods Council. Grains of Truth about Baking Terms. www.wheatfoods.org