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Metric Conversion Factors

The metric measures for the formulas used in this book are provided below with their equivalent U.S. measurements.

In each formula the metric amount is rounded up or down to the nearest whole number. The temperature conversion from Fahrenheit to Celsius is provided, as is the length conversion from inches to centimeters.

To Convert Weight:

1 ounce = 28.35 grams.
To convert ounces to grams: Multiply the number of ounces by 28.35.

1 gram = .035 ounces.
To convert grams to ounces: Multiply the number of grams by .03527.

1 kilogram = 2.2 pounds.
To convert kilograms to pounds: Multiply the number of kilograms by 2.2046.

To Convert Temperature:

Fahrenheit to Celsius:
Subtract 32 from the Fahrenheit temperature, multiply the results by 5, and then divide by 9.

Celsius to Fahrenheit:
Multiply the Celsius temperature by 9, divide the results by 5, and then add 32.

To Convert Inches to Centimeters:
1 inch = 2.54 centimeters
To convert inches to centimeters: Multiply the number of inches by 2.54.

To Convert Centimeters to Inches:
1 centimeter = .39 inches.
To convert centimeters to inches: Multiply the number of centimeters by .3937.
Baker’s Math System

Baker’s Percentage

Bakers frequently convert formulas to baker’s percentages to produce the desired number of servings. A baker’s percentage assigns each ingredient a certain percentage, by weight, in relation to the amount of flour in the formula. The weight of flour is important because it is the central ingredient in baked goods. The weight of flour in baking formulas is always 100%. In the United States flour is measured in pounds, while in countries using the metric system, it is measured in grams.

Using the Baker’s Percentage

The key to using the baker’s percentage is understanding that all ingredients are in ratio, or in relationship, to the total flour weight. Once the total amount of flour needed to produce the desired quantity of baked goods has been established, the weight of all the other ingredients can be calculated, assuming that the ratio of those ingredients to the total flour weight is known. The ratio of every ingredient is always expressed as a percentage of total flour weight.

To convert the weight of an ingredient into a percentage using the Baker’s Math System, use the following equation:

\[ \frac{\text{Ingredient Weight (IW)}}{\text{Total Flour Weight (TFW)}} \times 100 = \text{Ingredient Percentage (IP)} \]

Altitude Adjustments

**NECESSARY ADJUSTMENTS FOR ALTITUDES OF 5000 FEET AND 7500 FEET**

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Adjustment</th>
<th>5000 ft.</th>
<th>7500 ft.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baking powder</td>
<td>Decrease</td>
<td>40%</td>
<td>60%</td>
</tr>
<tr>
<td>Sugar</td>
<td>Decrease</td>
<td>6%</td>
<td>10%</td>
</tr>
<tr>
<td>Fats</td>
<td>Decrease</td>
<td>—</td>
<td>10%</td>
</tr>
<tr>
<td>Liquids</td>
<td>Increase</td>
<td>15%</td>
<td>22%</td>
</tr>
<tr>
<td>Eggs</td>
<td>Increase</td>
<td>10%</td>
<td>15%</td>
</tr>
<tr>
<td>Flour</td>
<td>Increase</td>
<td>4%</td>
<td>10%</td>
</tr>
</tbody>
</table>

**General Notes on Changes and Effects of Altitude Baking:**

- Flavoring agents such as vanilla and other extracts need not be adjusted because they are not integral moisture components.
- When yogurt or sour cream serve as the main moisture components in the formula, they should be treated as liquid and adjusted accordingly.
- Items that are cooked on a stove top, such as custards, need not be adjusted.
- Yeast-raised doughs do not usually change at 5000 feet. However, it is important to remember that weather and the age of the flour may alter the moisture content.
- Dryness is associated with high altitude air, which shortens the shelf life of baked products.
- Pans should be well greased and cooled cakes turned out promptly because baked goods have a greater tendency to stick at higher altitudes.

**Yeast Bread Adjustments for 7500 – 8000 Feet:**

- Flours are drier and more dehydration is necessary because of a loss of inert moisture.
  - Add 10% moisture
  - Reduce yeast by 10% (longer fermentation < yeast)
    - Range .05–6% based on flour weight.
    - Adjustment may not be needed if longer fermentation is utilized.
    - Ensure final proof achieves maximum volume to get best results.

**Yeast Bread Adjustments for 10,000 Feet:**

- Less proofing is required for 10,000 feet.
- Some sourdoughs will die off at altitudes above 10,000 feet.
- At 10,000 feet, water boils at 194° F (90° C).
Lettering and Script
<table>
<thead>
<tr>
<th>Happy Birthday</th>
<th>Happy Birthday</th>
</tr>
</thead>
<tbody>
<tr>
<td>Congratulations</td>
<td>Congratulations</td>
</tr>
<tr>
<td>To Mother</td>
<td>to Mother</td>
</tr>
<tr>
<td>Halloween</td>
<td>Halloween</td>
</tr>
<tr>
<td>Happy Easter</td>
<td>Happy Easter</td>
</tr>
<tr>
<td>Sweet Sixteen</td>
<td>Sweet Sixteen</td>
</tr>
<tr>
<td>Best Wishes</td>
<td>Best Wishes</td>
</tr>
<tr>
<td>Thanksgiving</td>
<td>Thanksgiving</td>
</tr>
<tr>
<td>Merry Christmas</td>
<td>Merry Christmas</td>
</tr>
</tbody>
</table>
Piping Designs
Cake Top Design

Side Patterns
Finishing Designs
Torte Slices
Petits Fours
Appendix
Templates
Chocolate Showpiece
Flowers piped separately and glued on.

Base
(Dark Blue)

Support
(White)

Back view of assembled showpiece.

Sugar Centerpiece
Appendix

$P = \text{Pastillage}$  
$\text{R.I.} = \text{Royal Icing}$

Front Windows  
$2 \times \text{R.I.}$

Top Window  
$1 \times \text{R.I.}$

Roof  
$2 \times P.$

Side  
$2 \times P.$

Cut out.

Gate  
$2 \times \text{R.I.}$

Stairs  
$1 \times P.$

Front $1 \times P$  
Back $1 \times P$  
(no windows)

Cut out and use as door.

Tower  
$2 \times P.$

Tower  
$2 \times P.$

Roof  
$4 \times P.$

Side Windows  
$6 \times \text{R.I.}$

Wall  
$2 \times P.$

Church Template
Window trim and other delicate work is royal icing.

Tree is rolled fondant or royal icing.

Base is covered with rolled fondant.

Pastillage Showpiece