BAKING POWDER, SODA & YEAST LEAVENING GUIDE

THE SCIENCE OF OVEN RISE | CHEMICAL VS. BIOLOGICAL LEAVENERS, VIABILITY TESTS & RATIOS

BAKING SODA VS. BAKING POWDER: THE GOLDEN DISTINCTION:
Baking Soda is 100% pure base (needs acid to bubble). Baking Powder is soda pre-blended with dry acid (activates on moisture & heat).

BAKING POWDER TEST

1 Tsp powder in 1/3 Cup warm tap water

Instant, vigorous fizzing and bubbling means active. If flat or weak, discard.

BAKING SODA TEST

1/2 Tsp soda in 1 Tbsp white vinegar

Immediate, explosive volcanic foaming means fresh. If sluggish, replace immediately.

ACTIVE YEAST PROOF TEST

1 Pkt yeast + 1 Tsp sugar in 1/4 C 110°F water

Wait 10 minutes: creamy, aromatic foam should rise to 1/2 cup mark.

CHEMICAL & BIOLOGICAL LEAVENING BEHAVIOR & RULES

Leavening Agent	Activation Trigger	Standard Ratio (per 1 Cup Flour)	Rise Reaction Mechanism
Baking Soda (Sodium Bicarbonate)	Moisture + Acidic ingredient	1/4 Tsp per 1 Cup Flour	Immediate CO_2 release upon mixing; bake batter immediately.
Single-Acting Baking Powder	Moisture / Liquid contact only	1 to 1.25 Tsp per 1 Cup Flour	Fast initial gas release; must enter hot oven right away.
Double-Acting Baking Powder	1st: Liquid, 2nd: Oven Heat	1 to 1.25 Tsp per 1 Cup Flour	Releases 1/3 gas in bowl, 2/3 gas when heated above 140°F in oven.
Active Dry Yeast (Dormant)	Warm Liquid (105°F - 115°F)	1 Packet (2.25 tsp / 7g) per 3-4 C	Requires proofing in warm sweetened liquid to dissolve outer casing.
Instant Yeast (Rapid Rise)	Direct flour blend (120°F - 130°F)	3/4 Packet per 3-4 Cups Flour	Finer granules; mix directly with dry ingredients without proofing.
Fresh Cake Yeast (Compressed)	Crumble into lukewarm water (95°F)	2x weight of active dry yeast	High moisture, short 2-week shelf life; prized for sweet pastries.
Cream of Tartar (Potassium Bitartrate)	Added with baking soda	1/2 Tsp per 1/4 Tsp Baking Soda	Dry acid salt that activates baking soda and stabilizes egg whites.

ACIDS THAT ACTIVATE BAKING SODA

Buttermilk & Sour Milk:
Lactic acid neutralizes soda, creates tender crumb.

Brown Sugar & Molasses:
Naturally acidic cane syrup creates rich rise & chew.

Natural Cocoa Powder:
Natural cocoa is acidic (pH 5.5). Dutch cocoa is alkalized (pH 7.0) and will NOT activate soda!

Citrus Juice & Vinegar:
Lemon, lime, orange, and apple cider vinegar.

Yogurt & Sour Cream:
High-fat dairy acidity gives cakes plush moisture.

Pure Honey & Maple Syrup:
Mild acidity activates small amounts of baking soda.

YEAST WATER TEMPERATURE RULES

Below 70°F (21°C):
Dormant / Sluggish. Yeast multiplies very slowly (used in overnight cold retardation).

75°F - 85°F (24°C - 29°C):
Ideal Room Fermentation. Optimal flavor development and steady dough rising.

105°F - 115°F (40°C - 46°C):
Active Dry Proofing. Target temperature for blooming dried yeast granules in warm water.

120°F - 130°F (49°C - 54°C):
Instant Yeast Flour Mix. Maximum safe temp when mixing yeast directly with dry flour.

Above 140°F (60°C):
THE KILL ZONE. Thermal death point. Yeast cells die instantly. Always test water on wrist!