Purpose:

- old manual calculator by Lee Valley Tools used to convert metric food weights to volume.

Usage:

- C++ object programming with table as array and create formulas from instructions

Using Specific Gravity to Convert Metric Food Weights to Volume

To convert metric weights to North American cups, tablespoons, etc., you need to know the specific gravity of the food. The table on the reverse of this card gives the average specific gravity of most common recipe ingredients that are stated by gram weight in European recipes plus a few (e.g. molasses) that are usually stated by volume, the case with liquids in general. To use this table, you first divide the weight in grams by the specific gravity to determine what the volume would be in millilitres. You can then convert millilitres to cups, teaspoons, tablespoons, etc., as applicable.

For example, if you want to convert 150 gm of cocoa (which has a specific gravity of 0.5) to cups, you divide the weight of 150 gm by 0.5 to convert it to 300 millilitres and then convert the millilitres to cups.

Using the calculator, you would divide 150 by 0.5 to get 300. You then press "ml" followed by "cup". The answer of 1.32 cups of cocoa is the equivalent of 150 grams. You would use 1 1/3 cups. If the recipe called for only 15 grams of cocoa you would divide 15 by 0.5 to get 30 then press "ml" followed by "cup" to convert to 0.132 cups. That being an awkward measure, you might press "tbsp" to get 2.12 and then maybe "tsp" to get 6.35. You could use either measurement or combine them by using 2 tbsp plus 1/3 tsp.

One of the great features of the Lee Valley Kitchen Calculator is the time saving feature that once you have entered the base data (e.g. 30 ml) you can press as many conversion buttons as you wish and it will keep converting the 30 ml to whatever you wish, without having to re-enter it.

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Lee Valley Kitchen Calculator

This calculator is specifically programmed to convert European recipes into North American units of measure as well as to perform the normal functions of mathematical calculation. The mathematical part of the calculator acts as you would expect. If you want to multiply 12 by 16 you first press 12, then the multiplication sign, followed by 16 and then the "equals" sign. The answer (192) is then displayed.

For conversion use, this process has been simplified. If you want to convert 800 ml into cups, you enter 800, then "ml" and then "cup" to get 3.527 cups. If you want to convert this to pints, you simply press "pint" to get 1.764 pints. If you want to convert this to ounces, you press "oz" to get 28.22. Each time you will notice that the display will show both the quantity and the unit of that quantity. There is no need to press an "equals" sign at any time and no need to re-enter the quantity to be converted when you are using the conversion system.

Note:
Some compromises between standards of different countries were necessary in design. We have ignored the difference between the Imperial and the US fluid ounce since the small difference will not materially affect any recipe. Also, since different English-speaking countries define the tablespoon as 1/15, 1/16 and 1/18 of a cup, we have standardized on 1/16.

The basic relationships used by this calculator are:

- 3 tsp = 1 tbsp
- 16 tbsp = 1 cup
- 2 cups = 1 pint = 16 oz
- 2 pints = 1 quart
- 1 pint = 453.6 ml
- 1 litre = 1000 ml
- 1 kg = 1000 gm

Specific Gravity of Foods & Spices

Almonds, blanched	0.66	Chocolate, grated	0.56	Ginger, ground	0.41	Peas, canned	1.0
sliced	0.32	Cinnamon, ground	0.5	Grapes, seeded	0.73	dried	0.85
ground	0.44	Citron, dried, chopped	0.81	whole	0.5	Pecans	0.56
Apples, sliced	0.44	Cloves, ground	0.5	Hazelnuts, whole	0.54	Pepper, ground	0.5
Apricots, halves	1.0	whole	0.38	Ham, diced	0.66	Peppers, chopped	0.66
Baking powder	1.0	Cocoa	0.5	Honey	1.5	Pistachios	0.55
Baking soda	0.8	Coconut, shredded	0.31	Horse radish	1.0	Poppy seed	0.62
Bananas, diced	0.81	Corn, kernels	1.0	Jam	1.5	Prunes, dried	0.81
Barley, dried	1.0	Cornmeal	0.66	Jelly	1.33	Raisins	0.68
Beans, dried	0.81	Corn syrup	1.5	Lard	1.0	Raspberries	0.6
Bean sprouts	0.5	Cornstarch	0.5	Lettuce, shredded	0.29	Rhubarb, diced	0.5
Blueberries	0.88	Cracker crumbs	0.38	Margarine	1.0	Rice, uncooked	1.0
Bread crumbs, dried	0.5	Cranberries	0.5	Mayonnaise	1.0	Sage, ground	0.25
soft	0.25	Cream of tartar	0.66	Meat, cooked, chopped	1.0	Salt	1.32
Brussels sprouts	0.5	Cream, whipping	1.0	Milk, non-fat dry	0.5	Sesame seed	0.68
Butter	1.0	whipped	0.5	Molasses	1.5	Shallots, diced	0.79
Cabbage, shredded	0.5	Cucumbers, diced	0.66	Mustard, ground	0.44	Shortening	0.88
Carrots, diced	0.66	Currants, dried	0.66	prepared	1.0	Soybeans	0.88
Celery seed	0.5	Curry powder	0.5	seed	0.8	Strawberries	0.88
Cheese, cottage	1.0	Dates, pitted	0.78	Noodles, cooked	0.66	Suet, ground	0.56
cream	1.0	Eggs, fresh	1.0	Nutmeg, ground	0.5	Sugar, brown	0.68
soft, grated	0.5	Farina, raw	0.66	Oats, rolled	0.44	brown, packed firm	1.0
Parmesan, grated	0.5	Figs, diced	0.81	Onions, chopped	0.81	Sugar, granulated	1.0
Ricotta	1.1	Flour, all purpose	0.5	Paprika	0.5	confectioner's	0.66
Cherries, glacé	0.81	bread, sifted	0.5	Parsley, chopped	0.12	Tapioca, pearl	0.72
Chicken, cooked, cubed	0.66	cake	0.41	Peanuts	0.62	Vanilla	1.0
Chili powder	0.5	rye	0.35	Peanut butter	1.12	Vinegar	1.0
Chocolate chips	0.7	soy	0.41	Peaches, chopped	1.0	Walnuts, halved	0.5