

Apothecary Weights and Measures Tutorial

Apothecary Vocabulary and Symbols

N.B. - Scale given is small to large

Dry Measurements

grain (equivalent to 1 minim liquid)

Symbols which may be used to express a grain:

G.  gr.

*Alternate Spellings: **grayne, granum***

scruple

*Alternate Spellings: **scrupulus***

drachm

     dr

Alternate Spellings:

drachma, dragme, dramme, dram



ounce

     *These last two usages are rare*

Alternate Spellings:

unce, unciam, uncia, once, oncia, oz

pound

  lb. l.

Alternate Spellings:

pounde

Liquid Measurements

minim (equivalent to 1 grain dry)

It should be borne in mind that minim and drop are not the same quantities, the former containing nearly half as much more as the latter, thus 10 minims of Tincture of Opium are equal to 15 drops ; formerly it was customary to prescribe all medicines by drops as let fall from the mouth of a bottle; but the quantity in a certain number of these differed so considerably, according to the density of the fluid, or the vessel it was dropped from, that an alteration in the plan was found necessary, and that of admeasurement was adopted ¹

Alternatively, Some systems equate a drop with a minim


Symbols which may be used to express a minim:

m min  M 

gutte, a drop - expressed as “**gtt**”

drachm and ounce: *same as dry*

pint, (Octarius) expressed as “**O**”

quart, quarterne, quarter = “**qt**”
or expressed as some variant of “q”, may be like: 

gallon, (Congius) expressed as “**C**”

Fractions

$1/2$ = ss, šš, Ss, ſs, fs, ſs, ſſ B, ß, ß, ß,
ß, ß, ß, ß

handful - *usage is uncommon*

A handful is written thus _____ M.j.

Halfe a handful thus _____ M.ß.

A little handful thus _____ P.j.

¹ from the book “The Corner Cupboard; Or, Facts For Everybody”, by Robert Kemp Philp.

Quantity

Quantities are expressed using the Roman Numeral System, and all numerals are lower case. If you never had the opportunity to learn this numerical system, then now is your chance:

1 = i The fly in the ointment comes when other letters are substituted for something listed here, prime case in point is j, instead of i. Some notations use j interchangeably for i, and some notations use it only for the last in a set of more than one i.
 5 = v
 10 = x
 50 = l e.g. iii = iij = 3
 100 = c

LEARNING THE ROMAN NUMERAL SYSTEM:

To figure out the numerical quantity called for, start with the first lower case letter, following the size needed, and tally them up together, adding from left to right.

When you encounter a smaller number before a larger number, that smaller number will be subtracted from the larger number before continuing to tally the total.

i = j = 1	xi = xj = 11	xxx = 30
ii = ij = 2	xii = xij = 12	xxxx = xl = 40
iii = iij = 3	xiii = xiiij = 13	l = 50
iiij = iv = 4	xiv = xjv = 14	lx = 60
v = 5	xv = 15	lxx = 70
vi = vj = 6	xvi = xvj = 16	lxxx = 80
vii = vij = 7	xvii = xvij = 17	xc = 90
viii = viij = 8	xviii = xviiij = 18	c = 100
viiii = viiij = ix = 9	xix = 19	d = 500
x = 10	xx = 20	m = 1000

Larger numbers are indicated by putting a horizontal line over them, which means to multiply the number by 1,000. Hence the V at left has a line over the top, which means 5,000.

V

Application:

<u>℥</u> = Ounces	<u>℥</u> = Scruple	<u>O</u> = pint	<u>G, gr.</u> = grains
℥i = 1 ounce	℥i = 1 scruple	Oi = 1 pint	gr.iij = 3 grains
℥iiss = 1.5 ounces	℥iiss = 1.5 scruples	Oiiss = 1.5 pints	Gviiij = 8 grains
℥ij = 2 ounces	℥ii = 2 scruples		
℥iiss = 2.5 ounces			
℥iiijss = 3.5 ounces	<u>ʒ</u> = Dram	<u>C</u> = Gallon	
℥iv = 4 ounces	ʒss = 1/2 dram	Ci = 1 gallon	
℥v = 5 ounces	ʒiij = 3 drams	Ciiss = 1.5 gallons	
℥x = 10 ounces	ʒvss = 5.5 drams	Cij = 2 gallons	
℥xss = 10.5 ounces	ʒvij = 7 drams	Cijss = 2.5 gallons	

N.B. grams and grains may look similar in their notational appearance, through assumptive behaviour and inexperience. Extra care should be taken not to confuse these quantities. Grams would be noted as a quantity, followed by a lower case “g”, and without a period following it, e.g: “5g” Conversely, in Apothecary notation, the size of the measurement comes first, *followed* by the quantity.

Equivalency Tables

Table 2.5 Table of Apothecary Fluid Measure

Apothecaries' System Fluid Measure Equivalencies					
60 minims (m)	=	1 fluidrachm or fluidram (fʒ or ʒ) ^a			
8 fluidrams (480 minims)	=	1 fluidounce (fʒ or ʒ) ^a			
16 fluidounces	=	1 pint (pt)			
2 pints (32 fluidounces)	=	1 quart (qt)			
4 quarts (8 pints)	=	1 gal (gal)			
These Equivalencies May Also Be Written as Follows					
gal	qt	pt	fʒ	ʒ	m
1	4	8	128	1024	61440
	1	2	32	256	15360
		1	16	128	7680
			1	8	480
				1	60

^aWhen it is clear that a liquid is to be measured, the *f* may be omitted from this symbol.

Table 2.6 Table of Apothecary Weight Measure

Apothecaries' System Weight Measure Equivalencies				
20 grains	=	1 scruple (ʒ)		
3 scruples (60 grains)	=	1 drachm or dram (ʒ)		
8 drachms (480 grains)	=	1 ounce (ʒ)		
12 ounces (5760 grains)	=	1 pound (lb)		
These Equivalencies May Also Be Written as Follows				
lb	ʒ	ʒ	ʒ	Grain
1	12	96	288	5760
	1	8	24	480
		1	3	60
			1	20

Source: Pharmaceutical Calculations for the Pharmacy Technician
By Barbara E. Lacher

TABLE 6.2 Apothecary Units of Volume

UNIT	VOLUME	SYMBOL
Minim*	1 drop of water	m or min
Fluidram†	60 minims	fʒ
Fluidounce†	8 fluidrams	fʒ
Pint	16 fluidounces	pt or O
Quart	2 pints	qt
Gallon	4 quarts	gal or C

*The minim is the basic unit.

†When the substance is known to be a liquid, the term fluid does not have to be used.

TABLE 6.1 Apothecary Units of Weight

UNIT	WEIGHT	SYMBOL
Grain*	—	gr
Dram	60 grains	ʒ
Ounce	8 drams	ʒ or oz
Pound	12 ounces†	lb

*The grain is the basic unit.

†A pound in this system is equal to 12 ounces; a pound in the English system is equal to 16 ounces.

Source: Math for Nurses: A Pocket Guide to Dosage Calculation and Drug Preparation
By Mary Jo Boyer

Absolute Funkiness . . . Troy and Avoirdupois and Apothecary

Author's/Compiler's Apology: I realize that some graphical comparisons and equivalency tables are repetitive, but since the issue here is a comparative and contrasting analysis of five different systems of weights and measures, different graphical representations may help different types of readers understand the information better, so several styles of graphics are used to convey the same information.

How many ounces in a pound?

It depends on which type of pound you are referencing. There are 16 ounces in an Avoirdupois Weight pound. There are 12 ounces in a Troy Weight pound and 12 ounces in a pound of Apothecaries' Weight. In the USA, the Avoirdupois unit is the standard, which makes the US pound equal to 16 ounces.

What about Fluid Measurements?

One fluid ounce is 1/16 of a U.S. pint, 1/32 of a U.S. quart, and 1/128 of a U.S. gallon. The fluid ounce derives its name originally from being the volume of one ounce avoirdupois of water, but in the U.S. it is defined as 1/128 of a U.S. gallon. Consequently, a fluid ounce of water weighs about 1.041 ounces avoirdupois.

The saying "a pint's a pound the world around" refers to 16 US fluid ounces of water weighing approximately one pound avoirdupois in the United States, but that is true only in the United States. In the rest of the English-speaking world, an Imperial pint—being 20 Imperial ounces of water—will weigh one and a quarter pounds. An Imperial pint is approximately 19.2 US fluid ounces. The Imperial pint is approximately 568.26 mL. The US liquid pint is approximately 473.2 mL.

And, making matters worse, the British and the American Apothecary weights and measures are also different, as the Troy and Avoirdupois weights and measures are different...

OH BOY!! What a Mess!

In this Global Digital age, where you can either download or purchase books or formulas from anywhere worldwide, a solid understanding of the original source and date of the formula must first be ascertained before one can, at least with a little more accuracy, determine the actual weights and measures to be used in the formula at hand.

Apothecaries' Weight

A system of units of mass used by druggists in the English-speaking world, before 15th – 19th century. The pound, ounce, and grain of apothecaries' weight have the same magnitudes as the corresponding units in troy weight, but the scruple and dram are not found in troy weight. The division of the pound into 12 ounces is undoubtedly modeled on the Roman libra, but how the apothecaries' pound got its present value is controversial.

					pound	
				ounce	12	
			dram	8	24	96
		scruple	3	60	240	288
grain	20	60	180	480	5760	
0.0648	1.296	3.888	31.10	0.373		
grams	grams	grams	grams	kilograms		

By the middle of the 18th century, English druggists were using avoirdupois weight instead of apothecaries' weight, at first to measure what they sold, and then for compounding medicines as well. By the middle of the 19th century apothecaries' weight had largely disappeared. In the United Kingdom the Medical Act of 1858 required the use of avoirdupois weight; the Weights and Measures Act of 1878 retained only the apothecaries' ounce, and that merely permissively.

British Apothecaries' Measure, 1878 to 1 February 1971¹

Conversion to
Troy System

				imperial gallon	
				fluid ounce	160
				fluid drachm	8
				fluid scruple	3
				minim	20
0.059 mL	1.184 mL	3.55163 mL	28.41 mL	480	76,800
0.96	19.2	0.96	0.96	U.S. fluid ounce	1.20095
U.S. minim	U.S. minims	fluid dram (US)	U.S. fluid ounce	U.S. gallons	

← Avoirdupois

1. Schedule 2, Weights and Measures Act 1878 (41 & 42 Victoria c.48)

U.S. Apothecaries' Measure, to Present

Conversion to
Avoirdupois System

				U.S. gallon	
				U.S. liquid pint	8
				U.S. fluid ounce	16
				fluid dram	8
				minim	60
0.062 mL	3.697 mL	29.57 mL	473 mL	7,680	61,440
				U.S. fluid ounce	128
				U.S. liquid pint	1,024
				U.S. gallon	3,785

http://www.sizes.com/units/apothecaries_measure.htm#U.S.

Systems of Weights

AVOIRDUPOIS

Primary unit of weight is the grain.

437.5 grains = 1 ounce
(av. oz.)

16.0 ounces = 1 pound
(av. lb.)

APOTHECARY

Primary unit of weight is the grain.

20 grains (gr) = 1 scruple (℥)
3 scruples = 1 dram (℥)
8 drams
(480 gr) = 1 ounce (℥)
12 ounces = 1 pound (lb)

Systems of Volume Measures

APOTHECARY

Smallest unit of volume is the minim.

60 minims (m) = 1 fluid dram (℥)
8 fluid drams = 1 fluid ounce (℥)
16 fluid ounces = 1 pint (p)
2 pints = 1 quart (qt.)
4 quarts = 1 gallon (Cong. or gal.)

American Avoirdupois and Apothecary Systems Equivalents

Units of Capacity or Volume - Liquid Volume Measure

(all underlined figures are exact)

Units	Minims	Fluid Drams	Fluid Ounces	Gills
1 minim =	<u>1</u>	0.016 666 67	0.002 083 333	0.000 520 833 3
1 fluid dram =	<u>60</u>	<u>1</u>	<u>0.125</u>	<u>0.031 25</u>
1 fluid ounce =	<u>480</u>	<u>8</u>	<u>1</u>	<u>0.25</u>
1 gill =	<u>1920</u>	<u>32</u>	<u>4</u>	<u>1</u>
1 liquid pint =	<u>7680</u>	<u>128</u>	<u>16</u>	<u>4</u>
1 liquid quart =	<u>15 360</u>	<u>256</u>	<u>32</u>	<u>8</u>
1 gallon =	<u>61 440</u>	<u>1024</u>	<u>128</u>	<u>32</u>
1 cubic inch =	265.974 0	4.432 900	0.554 112 6	0.138 528 1
1 cubic foot =	459 603.1	7680.052	957.506 5	239.376 6
1 milliliter =	16.230 73	0.270 512 2	0.033 814 02	0.008 453 506
1 liter =	16 230.73	270.512 2	33.814 02	8.453 506

Units	Liquid Pints	Liquid Quarts	Gallons	Cubic Inches
1 minim =	0.000 130 208 3	0.000 065 104 17	0.000 016 276 04	0.003 759 766
1 fluid dram =	<u>0.007 812 5</u>	<u>0.003 906 25</u>	<u>0.000 976 562 5</u>	0.225 585 94
1 fluid ounce =	<u>0.062 5</u>	<u>0.031 25</u>	<u>0.007 812 5</u>	<u>1.804 687 5</u>
1 gill =	<u>0.25</u>	<u>0.125</u>	<u>0.031 25</u>	<u>7.218 75</u>
1 liquid pint =	<u>1</u>	<u>0.5</u>	<u>0.125</u>	<u>28.875</u>
1 liquid quart =	<u>2</u>	<u>1</u>	<u>0.25</u>	<u>57.75</u>
1 gallon =	<u>8</u>	<u>4</u>	<u>1</u>	<u>231</u>
1 cubic inch =	0.034 632 03	0.017 316 02	0.004 329 004	<u>1</u>
1 cubic foot =	59.844 16	29.922 08	7.480 519	<u>1728</u>
1 milliliter =	0.002 113 376	0.001 056 688	0.000 264 172 1	0.061 023 74
1 liter =	2.113 376	1.056 688	0.264 172 1	61.023 74

Units	Cubic Feet	Milliliters	Liters
1 minim =	0.000 002 175 790	0.061 611 52	0.000 061 611 52
1 fluid dram =	0.000 130 547 4	3.696 691	0.003 696 691
1 fluid ounce =	0.001 044 379	29.573 53	0.029 573 53
1 gill =	0.004 177 517	118.294 1	0.118 294 1
1 liquid pint =	0.016 710 07	473.176 5	0.473 176 5
1 liquid quart =	0.033 420 14	946.352 9	0.946 352 9
1 gallon =	0.133 680 6	3785.412	3.785 412
1 cubic inch =	0.000 578 703 7	16.387 06	0.016 387 06
1 cubic foot =	<u>1</u>	28 316.85	28.316 85
1 milliliter =	0.000 035 314 67	<u>1</u>	<u>0.001</u>
1 liter =	0.035 314 67	<u>1000</u>	<u>1</u>

**Apothecary, Avoirdupois and Troy Equivalents
Units of Mass Not Greater Than Pounds or Kilograms
(all underlined figures are exact)**

Units	Grains	Apothecaries Scruples	Pennyweights	Avoirdupois Drams
1 grain =	<u>1</u>	<u>0.05</u>	0.041 666 67	0.036 571 43
1 apoth. scruple =	<u>20</u>	1	0.833 333 3	0.731 428 6
1 pennyweight =	<u>24</u>	<u>1.2</u>	1	0.877 714 3
1 avdp. dram =	<u>27.343 75</u>	<u>1.367 187 5</u>	1.139 323	1
1 apoth. dram =	<u>60</u>	<u>3</u>	<u>2.5</u>	2.194 286
1 avdp. ounce =	<u>437.5</u>	<u>21.875</u>	18.229 17	<u>16</u>
1 apoth. or troy oz. =	<u>480</u>	<u>24</u>	<u>20</u>	17.554 29
1 apoth. or troy pound =	<u>5760</u>	<u>288</u>	<u>240</u>	210.651 4
1 avdp. pound =	<u>7000</u>	<u>350</u>	291.666 7	<u>256</u>
1 milligram =	0.015 432 36	0.000 771 617 9	0.000 643 014 9	0.000 564 383 4
1 gram =	15.432 36	0.771 617 9	0.643 014 9	0.564 383 4
1 kilogram =	15432.36	771.617 9	643.014 9	564.383 4

Units	Apothecaries Drams	Avoirdupois Ounces	Apothecaries or Troy Ounces	Apothecaries or Troy Pounds
1 grain =	0.016 666 67	0.002 285 714	0.002 083 333	0.000 173 611 1
1 apoth. scruple =	0.333 333 3	0.045 714 29	0.041 666 67	0.003 472 222
1 pennyweight =	<u>0.4</u>	0.054 857 14	<u>0.05</u>	0.004 166 667
1 avdp. dram =	0.455 729 2	<u>0.062 5</u>	0.56 966 15	0.004 747 179
1 apoth. dram =	1	0.137 142 9	<u>0.125</u>	0.010 416 67
1 avdp. ounce =	7.291 667	1	0.911 458 3	0.075 954 86
1 apoth. or troy ounce =	<u>8</u>	1.097 143	1	0.083 333 333
1 apoth. or troy pound =	<u>96</u>	13.165 71	<u>12</u>	1
1 avdp. pound =	116.666 7	<u>16</u>	14.583 33	1.215 278
1 milligram =	0.000 257 206 0	0.000 035 273 96	0.000 032 150 75	0.000 002 679 229
1 gram =	0.257 206 0	0.035 273 96	0.032 150 75	0.002 679 229
1 kilogram =	257 206 0	35.273 96	32.150 75	2.679 229

Units	Avoirdupois Pounds	Milligrams	Grams	Kilograms
1 grain =	0.000 142 857 1	<u>64.798 91</u>	<u>0.064 798 91</u>	<u>0.000 064 798 91</u>
1 apoth. scruple =	0.002 857 143	<u>1295.978 2</u>	<u>1.295 978 2</u>	<u>0.001 295 978 2</u>
1 pennyweight =	0.003 428 571	<u>1555.173 84</u>	<u>1.555 173 84</u>	<u>0.001 555 173 84</u>
1 avdp. dram =	0.003 906 25	<u>1771.845 195 312 5</u>	<u>1.771 845 195 312 5</u>	<u>0.001 771 845 195 312 5</u>
1 apoth. dram =	0.008 571 429	<u>3887.934 6</u>	<u>3.887 934 6</u>	<u>0.003 887 934 6</u>
1 avdp. ounce =	<u>0.062 5</u>	<u>28 349.523 125</u>	<u>28.349 523 125</u>	<u>0.028 349 523 125</u>
1 apoth. or troy ounce =	0.068 571 43	<u>31 103.476 8</u>	<u>31.103 476 8</u>	<u>0.031 103 476 8</u>
1 apoth. or troy pound =	0.822 857 1	<u>373 241.721 6</u>	<u>373.241 721 6</u>	<u>0.373 241 721 6</u>
1 avdp. pound =	1	<u>453 592.37</u>	<u>453.592 37</u>	<u>0.453 592 37</u>
1 milligram =	0.000 002 204 623	1	<u>0.001</u>	<u>0.000 001</u>
1 gram =	0.002 204 623	<u>1000</u>	1	<u>0.001</u>
1 kilogram =	2.204 623	1 000 000	1000	1

1 dram, fluid (or liquid) (fl dr or $\text{f}\overline{\text{3}}$) (U.S.)-----	1/8 fluid ounce (exactly). 0.226 cubic inch. 3.697 milliliters. 1.041 British fluid drachms.
[1 drachm, fluid (fl dr) (British)]----	0.961 U.S. fluid dram. 0.217 cubic inch. 3.552 milliliters.
1 milliliter (mL)-----	0.271 fluid dram. 16.231 minims. 0.061 cubic inch.
1 ounce, fluid (or liquid) (fl oz or $\text{f}\overline{\text{3}}$) (U.S.)-----	1.805 cubic inches. 29.573 milliliters. 1.041 British fluid ounces.-
[1 ounce, fluid (fl oz) (British)]----	0.961 U.S. fluid ounce. 1.734 cubic inches. 28.412 milliliters.
1 pint (pt), dry-----	33.600 cubic inches. 0.551 liter.
1 pint (pt), liquid-----	28.875 cubic inches exactly. 0.473 liter.
1 quart (qt), dry (U.S.)-----	67.201 cubic inches. 1.101 liters. 0.969 British quart.
1 quart (qt), liquid (U.S.)-----	57.75 cubic inches (exactly). 0.946 liter. 0.833 British quart.
[1 quart (qt) (British)]-----	69.354 cubic inches. 1.032 U.S. dry quarts. 1.201 U.S. liquid quarts.
1 gallon (gal) (U.S.)-----	231 cubic inches (exactly). 3.785 liters. 0.833 British gallon. 128 U.S. fluid ounces (exact-ly).
[1 gallon (gal) (British Imperial)]----	277.42 cubic inches. 1.201 U.S. gallons. 4.546 liters. 160 British fluid ounces (exactly).
1 liter (1 cubic decimeter exactly)----	1.057 liquid quarts. 0.908 dry quart. 61.025 cubic inches

1 dram apothecaries (dr ap or $\overline{\text{3}}$)----	60 grains (exactly). 3.888 grams.
1 dram avoirdupois (dr avdp)-----	27-11/32 (= 27.344) grains. 1.777 grams.
1 grain-----	64.798 91 milligrams (exactly).
1 gram (g)-----	15.432 grains. 0.035 ounce, avoirdupois.
1 milligram (mg)-----	0.015 grain.
1 ounce, avoirdupois (oz avdp)-----	437.5 grains (exactly). 0.911 troy or apothecaries ounce. 28.350 grams.
1 ounce, troy or apothecaries (oz t or oz ap or $\overline{\text{3}}$)-----	480 grains (exactly). 1.097 avoirdupois ounces. 31.103 grams.

Units of mass

Unit	Divisions	SI Equivalent
Most common measures shown in <i>italic font</i> Exact conversions shown in bold font		
Avoirdupois		
1 <i>grain</i> (gr)	$\frac{1}{7000}$ lb	64.798 91 mg
1 <i>dram</i> (dr)	$27\frac{11}{32}$ gr	1.771 845 g
1 <i>ounce</i> (oz)	16 dr	28.349 52 g
1 <i>pound</i> (lb)	16 oz	453.592 37 g
Troy		
1 <i>grain</i> (gr)	$\frac{1}{7000}$ lb av or $\frac{1}{5760}$ lb t	64.798 91 mg
1 <i>pennyweight</i> (dwt)	24 gr or 7.777 carats	1.555 174 g
1 <i>troy ounce</i> (oz t)	20 dwt	31.103 48 g
1 <i>troy pound</i> (lb t)	12 oz t or 13.17 oz av	373.241 7 g

1 pound, avoirdupois (lb avdp)-----	7000 grains (exactly). 1.215 troy or apothecaries pounds. 453.592 37 grams (exactly).
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TABLE OF BRITISH APOTHECARY MEASURE

20 minims	= 1 fluid scruple
3 fluid scruples	= 1 fluid drachm
	= 60 minims
8 fluid drachm	= 1 fluid ounce
20 fluid ounces	= 1 pint
8 pints	= 1 gallon (160 fluid ounces)

TABLES OF U.S. UNITS OF MEASUREMENT

Apothecaries Units of Liquid Volume

60 minims (min or)	= 1 fluid dram (fl dr or ʒ)	= 0.225 6 cubic inch
8 fluid drams	= 1 fluid ounce (fl oz or ʒ)	= 1.804 7 cubic inches
16 fluid ounces	= 1 pint (pt or)	
	= 28.875 cubic inches	
	= 128 fluid drams	
2 pints	= 1 quart (qt)	= 57.75 cubic inches
	= 32 fluid ounces	
	= 256 fluid drams	
4 quarts	= 1 gallon (gal)	= 231 cubic inches
	= 128 fluid ounces	
	= 1024 fluid drams	

Avoirdupois Units of Mass (U.S.)

[The "grain" is the same in avoirdupois, troy, and apothecaries units of mass.]

27-11/32 grains	= 1 dram (dr)
16 drams	= 1 ounce (oz)
	= 437-1/2 grains
16 ounces	= 1 pound (lb)
	= 256 drams
	= 7000 grains

Apothecaries Units of Mass (U.S.)

[The "grain" is the same in avoirdupois, troy, and apothecaries units of mass.]

20 grains	= 1 scruple (s ap or ʒ)
3 scruples	= 1 dram apothecaries (dr ap or ʒ)
	= 60 grains
8 drams apothecaries	= 1 ounce apothecaries (oz ap or ʒ)
	= 24 scruples
	= 480 grains
12 ounces apothecaries	= 1 pound apothecaries (lb ap)
	= 96 drams apothecaries
	= 288 scruples
	= 5760 grains

Table 6-3.—Conversion Table for Weights and Liquid Measures

Conversion Table for Weights and Liquid Measures	
1 grain	= 0.065 gram or 65 milligrams
1 gram	= 15.432 grains
1 milliliter	= 16.23 minims
1 fluid ounce	= 29.57 milliliters

Table 6-4.—Examples of Weight and Liquid Conversions

Examples of Weight and Liquid Conversions	
gr to g	gr/15.432 = g
ml to fl oz	ml/29.57 = fl oz
minims to ml	minims/16.23 = ml
mg to gr	mg/65 = gr
g to gr	g x 15.432 = gr
fl oz to ml	fl oz x 29.57 = ml
ml to minims	ml x 16.23 = minims
gr to mg	gr x 65 = mg

Reference: <http://ts.nist.gov/WeightsAndMeasures/Publications/appxc.cfm>

Finally, after obtaining a small set of vintage Apothecary weights, here are measured equivalents in grams:

1/2 grain = .035g	1/2 scruple = 0.645g
2 grains = .13g	1 scruple = 1.295g
3 grains = .20g	
4 grains = .26g	1/2 Drachm = 1.945g
5 grains = .32g	1 Drachm = 3.89g
6 grains = .39g	2 Drachms = 7.785g
40 grains = 2.60g	4 Drachms = 15.56g

All measurements were made on a digital scale with .005g accuracy, and were weighed 3X each. Still, the weights could be slightly off due to a zillion factors -PK

16th Century Apothecary Text

A handfull is written thus _____ M.j.
 Halfe a handfull thus _____ M.β.
 A little handfull thus _____ P.j.
 A Scruple thus _____ ʒ.j.
 A Dranne thus _____ ʒ.j.
 An ounce thus _____ ʒ.j.
 Halfe an ounce, or halfe a dranne thus _____ ʒ.β. — ʒ.β.
 An ounce and halfe, thus _____ ʒ.j.β.
 A Grayne thus _____ G.j.
 The number of any thing, thus _____ no.j.&c.
 A Pound, is thus _____ l.j.
 So much as shall suffice, thus _____ q.s.

(Ana) is of either of them.
 xx. Graynes make a Scruple.
 iij. Scruples, make a Dranne.
 viij. Drammes, make an ounce.
 xij. Ounces, make a pound.



Pictures enlarged for detail



PERFUMES.

47

Compound Essence of Orris.

Vanilla (cut very small) ℥ij
Orris root, bruised ℥vj
Essence of Peru balsam ℥j
Spirit ℥xv

Macerate fourteen days and filter.

Comp. Ess. of Tonka Bean.

Bruised orris root ℥ij
Tonka beans (cut small) ℥vj
Essence of ambergris Mxxx
Oil of ylang-ylang Mxxx
Compound essence of orris ℥iv
Oil of lemon ℥ss
Otto of rose ℥ss
Oil of bergamot Mlxxx
Spirit ℥xvj

Macerate fourteen days and filter.

Bouquets and Essences.

The following formulæ are for retail or French essences:

Alexanda Bouquet.

Oil of bergamot ℥iiiss
" " rose geranium ℥ss
Otto of rose ℥ss
Oil of cassia Mxv
Spirit Oj. Mix.

Translation:

Compound Essence of Tonka Bean

Bruised Orris Root 2 oz.
Tonka Beans (cut small) 6 drams
Essence of Ambergris 30 minims
Oil of Ylang-ylang 30 Minims
Compound essence of Orris 4 oz.
Oil of Lemon 1/2 dram
Otto of Rose 1/2 dram
Oil of Bergamot 80 minims
Spirit (Alcohol) 16 oz.
Macerate fourteen days and filter

Also note: at the bottom of the above picture, the last line in the Alexandra Bouquet says:

"Spirit Oj. Mix"

- This would read and translate to:
Spirit 1 pint. Mix (as in "Mix it up")

Blame me for all of the mistakes in this Document

Author and Compiler:

Paul Kiler

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