

Withdrawn NIST Technical Series Publication

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The attached publication has been withdrawn (archived), and is provided solely for historical purposes. It may have been superseded by another publication (indicated below).

Withdrawn Publication

Series/Number	NBS Miscellaneous Publication (SP) 39-3
Title	Household Weights and Measures
Publication Date(s)	June 1, 1926
Withdrawal Date	November 15, 1960
Withdrawal Note	Superceded by NBS Miscellaneous Publication (MP) 234

Superseding Publication(s) *(if applicable)*

The attached publication has been **superseded** by the following publication(s):

Series/Number	Superceded by NBS Miscellaneous Publication (MP) 234
Title	Household Weights and Measures
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Additional Information *(if applicable)*

Contact	Elizabeth Benham, Office of Weights and Measures
Latest revision of the attached publication	
Related Information	
Withdrawal Announcement Link	



HEIGHTS AND WEIGHTS OF CHILDREN

AGE	BOYS			GIRLS			AGE	BOYS			GIRLS			
	Height	Weight	Height	Weight	Height	Weight		Height	Weight	Height	Weight			
yr. mo. At birth	inches	lbs. oz.	centi- meters	inches	lbs. oz.	centi- meters	yr. mo.	inches	lbs. oz.	centi- meters	inches	centi- meters	lbs. oz.	kilograms
3	20 5/8	7	52.3	20 1/2	3	52.1	3	33 3/4	27	12.30	33 3/8	84.8	26	11.96
6	23 1/2	13	59.7	22	13	55.9	6	34 3/4	29	13.15	34 3/8	86.0	27	12.36
7	26 1/2	18	67.3	25 1/8	16	65.7	6	35 3/8	8	13.38	34 3/4	88.6	4	12.81
8	27 1/4	19	69.2	26 1/2	17	67.3	9	36 1/8	10	13.89	35 3/8	90.5	29	13.21
9	27 3/8	19	70.2	27 1/8	18	68.6	9	37 1/8	4	14.63	36 3/4	93.3	2	13.84
10	28 1/2	20	72.4	27 3/8	18	70.2	3	37 3/8	2	15.02	37 1/4	94.6	10	14.34
11	29	21	73.7	28 3/8	20	72.1	3	38 3/8	8	15.31	38	96.5	8	14.74
1	29 3/8	21	74.6	28 3/8	20	73.3	9	39	8	15.65	38 1/2	97.8	4	15.08
1	29 3/8	22	75.9	29 3/8	21	74.6	4	39 1/2	14	16.27	39	99.1	12	15.31
1	30 1/4	23	76.8	29 3/8	21	74.9	5	41 1/8	3	18.64	41 1/4	104.8	3	18.01
1	30 3/4	23	78.1	30 1/8	21	76.5	6	43 3/8	2	20.50	43 3/8	110.2	5	19.64
1	31 1/8	23	79.1	30 3/4	22	77.5	7	45 3/4	3	22.27	45 3/4	115.6	8	21.55
1	31 3/8	24	80.6	30 3/4	22	78.1	8	47 3/4	14	24.45	47 3/8	121.0	5	23.59
1	31 3/4	24	81.9	31 1/2	22	80.0	9	49 3/4	3	26.85	49 3/8	125.4	2	25.90
1	32 1/8	25	82.9	31 3/4	23	80.7	10	51 1/4	5	29.62	51 1/4	130.2	6	28.30
1	32 3/8	25	83.5	32 1/4	24	81.3	11	53 1/4	3	31.84	53 3/8	135.6	13	31.21
1	32 3/4	26	84.4	32 3/8	25	82.9	12	55 3/8	14	34.88	55 3/8	141.9	5	35.52
1	33 1/8	26	85.4	32 3/8	25	82.9	13	57 3/8	8	38.46	57 3/4	148.0	11	40.23
1	33 3/8	27	86.5	32 3/8	25	82.9	14	59 3/8	13	43.05	59 3/4	152.1	6	44.63
1	33 3/8	27	86.5	32 3/8	25	82.9	15	62 1/4	2	48.58	62 1/4	158.1	2	48.13
1	33 3/8	27	86.5	32 3/8	25	82.9	16	65	2	54.88	65	165.1	2	50.80

The data for this table were furnished by the Children's Bureau, United States Department of Labor, and is collated from such leading authorities as Holt, Crum, Bowditch, and others. There is a variation in height and weight of healthy children of the same age which should be taken into account in using the above figures to judge normal development.

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Miscellaneous Publications
No. 36

DEPARTMENT OF COMMERCE
BUREAU OF STANDARDS
GEORGE K. BURGESS, Director

HOUSEHOLD WEIGHTS AND MEASURES

Circular No. 55, of the Bureau of Standards, entitled "Measurements for the Household," contains in popular form a large amount of information which is very useful about the home. In addition to discussing weighing and measuring as done in the up-to-date kitchen, this circular treats of the measurement and economical use of heat, light, gas, electricity, water, time, etc. Copies may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C., at 45 cents each.

The object of this card is to present in convenient form the weights and measures tables most useful for household purposes, together with other weights and measures information of general interest.

Efficient housekeeping requires correct weighing and measuring. In addition to a 4-fluid-ounce glass graduate, a measuring cup, and a set of measuring spoons for cooking use, every kitchen should be provided with a reliable household weights and measures test set. This will be found indispensable in

checking the amounts of commodities purchased and very useful for a variety of other purposes.

A complete set comprises a weighing scale of from 10 to 30 or more pounds capacity graduated to 1 ounce or less, a set of liquid measures, and a yard measure or a steel tape 3 or 6 feet in length. These pieces should be of simple but rugged construction and of satisfactory accuracy, and should, whenever possible, be tested by and bear the seal of a weights and measures official.

ADVICE TO THE HOUSEWIFE

Buy by weight wherever possible.
In any event, buy by definite quantity and not by money's worth.
Learn the price per pound, per gallon, etc., of what you buy.
Learn to read the scale indications, and observe the weighing of your purchases.

Check your purchases for price extension and quantity delivered.
Become acquainted with your weights and measures official, and consult him if in doubt on any weights and measures matter.
Buy by weight wherever possible.

EQUIVALENTS OF THE COMMON CAPACITY UNITS USED IN THE KITCHEN

Units	Fluid drams	Teaspoons	Tablespoons	Fluid ounces	1/4 cupsful	Gills (1/2 cupsful)	Cupfuls	Liquid pints	Liquid quarts	Cubic centimeters	Liters	Units
1 fluid dram equals...	1	3/4	1/4	1/8	1/16	1/32	1/64	1/128	1/256	3.7	0.004	Equals 1 fluid dram
1 teaspoonful equals...	1 1/3	1	3/3	1/6	1/12	1/24	1/48	1/96	1/192	4.9	0.005	Equals 1 teaspoonful
1 tablespoonful equals...	4	3	1	1/2	1/4	1/8	1/16	1/32	1/64	15	0.015	Equals 1 tablespoonful
1 fluid ounce equals...	8	6	2	1	1/2	1/4	1/8	1/16	1/32	30	0.030	Equals 1 fluid ounce
1/4 cupful equals.....	16	12	4	2	1	1/2	1/4	1/8	1/16	59	0.059	Equals 1/4 cupful
1 gill (1/2 cupful) equals	32	24	8	4	2	1	1/2	1/4	1/8	118	0.118	Equals 1 gill (1/2 cupful)
1 cupful equals.....	64	48	16	8	4	2	1	1/2	1/4	237	0.237	Equals 1 cupful
1 liquid pint equals.....	128	96	32	16	8	4	2	1	1/2	473	0.473	Equals 1 liquid pint
1 liquid quart equals.....	256	192	64	32	16	8	4	2	1	946	0.946	Equals 1 liquid quart
1 cubic centimeter equals	0.27	0.20	0.068	0.034	0.017	0.0084	0.0042	0.0021	0.0011	1	1/1000	Equals 1 cubic centimeter
1 liter equals.....	270	203	67.6	33.8	16.9	8.45	4.23	2.11	1.05	1000	1	Equals 1 liter

WEIGHTS AND MEASURES TABLES

AVOIRDUPOIS WEIGHT

27 1/4 grains = 1 dram
16 drams = 1 ounce
16 ounces = 1 pound
7000 grains = 1 pound
100 pounds = 1 short hundredweight
112 pounds = 1 long hundredweight
2000 pounds = 1 short ton
2240 pounds = 1 long ton

LIQUID MEASURE

8 fluid drams = 1 fluid ounce
4 fluid ounces = 1 gill
4 gills = 1 pint liquid
2 pints liquid = 1 quart liquid
4 quarts liquid = 1 gallon
231 cubic inches = 1 gallon

DRY MEASURE

2 pints dry = 1 quart dry
8 quarts dry = 1 peck
4 pecks = 1 bushel
2150.42 cubic inches = 1 bushel
105 quarts dry = 1 standard barrel
7056 cubic inches = 1 standard barrel

The pint and quart dry measures are about 16% larger than the pint and quart liquid measures.

LINEAR MEASURE

12 inches = 1 foot
3 feet = 1 yard
5 1/2 yards = 1 rod
16 1/2 feet = 1 rod
40 rods = 1 furlong
8 furlongs = 1 statute mile
320 rods = 1 statute mile
1760 yards = 1 statute mile
5280 feet = 1 statute mile
6080.20 feet = 1 nautical mile

SQUARE MEASURE

144 square inches = 1 square foot
9 square feet = 1 square yard
30 1/4 square yards = 1 square rod
160 square rods = 1 acre
3560 square feet = 1 acre
160 acres = 1 quarter section
4 quarter sections = 1 square mile
640 acres = 1 square mile
36 square miles = 1 township

CUBIC MEASURE

1728 cubic inches = 1 cubic foot
27 cubic feet = 1 cubic yard
128 cubic feet = 1 cord

NOTE.—A "board foot," used in lumber measurements, is a volume equivalent to that of a board 1 foot by 1 foot by 1 inch, or 144 cubic inches.

NOTE.—A "knot" is a speed of 1 nautical mile per hour.

WEIGHTS OF SOLIDS

Anthracite coal (piled loose):	Coke (piled loose):	Sugar, granulated:
1 cubic foot = 50 to 57 pounds	1 cubic foot = 23 to 32 pounds	1 cup = 1/2 pound
1 short ton = 35 to 40 cubic feet	1 short ton = 62 to 87 cubic feet	Butter: 1 cup = 1/2 pound
1 long ton = 39 to 45 cubic feet	1 long ton = 70 to 97 cubic feet	Lard: 1 cup = 1/2 pound
Bituminous coal (piled loose):	Charcoal (of pine and oak):	Flour: 1 cup = 1/4 pound
1 cubic foot = 44 to 54 pounds	1 cubic foot = 15 to 30 pounds	Rice: 1 cup = 1/2 pound
1 short ton = 37 to 45 cubic feet	Ice:	Cornmeal: 1 cup = 5 ounces
1 long ton = 42 to 51 cubic feet	1 cubic foot = 57 pounds	Raisins (stemmed):
	1 pound = 30 cubic inches	1 cup = 6 ounces

These weights are approximate only and should not be used in trade for determining whether correct measure is given or received.
 Information concerning the weights per bushel of dry commodities which are legal in your State may be obtained by consulting your State laws, your weights and measures official, or Circular No. 10 of the Bureau of Standards.

COMMON RULES OF MEASUREMENT

- Rectangle:-----Area=length X width
- Circle: Circumference=3.1416 X diameter
- Area=0.7854 X diameter X diameter
- Cylinder: Area (exclusive of that of ends)=3.1416 X diameter X diameter X height
- Solid with rectangular sides:--Volume=length X width X height
- Volume=0.7854 X diameter X diameter X height

INTERNATIONAL METRIC SYSTEM

The fundamental unit of the metric system is the METER (the unit of length). From this the units of mass (GRAM) and capacity (LITER) were derived. All other units are the decimal subdivisions or multiples of these. These three units are simply related, so that for all practical purposes the volume of one kilogram of water (one liter) is equal to one cubic decimeter.

When the meaning of the three units and the six prefixes (shown in second column) is known, the metric system is understood. The design of the system makes it self-explanatory. The tables of derived units form themselves automatically. No tables need be or should be memorized.

Smaller and larger units are named by combining the proper numeral prefix with the name of the basic unit. The new term is self-defining—for example, "centi-meter." Here "centi" means "the one-hundredth part of," and "meter" means "the unit of length," so that "centimeter" expresses precisely its meaning, "the one-hundredth part of the unit of length." Every other metric term is as easily formed and expresses as clearly its own definite meaning.

Name	Value	Meaning
METER	1.	"the unit of length"
LITER	1.	"the unit of volume"
GRAM	1.	"the unit of weight"
ARE	1.	"the unit of area"
MILLI-	.001	"the thousandth part of"
CENTI-	.01	"the hundredth part of"
DECI-	.1	"the tenth part of"
DEKA-	10	"ten times"
HECTO-	100	"one hundred times"
KILO-	1000	"one thousand times"

Anthracite coal (piled loose):
 1 cubic foot = 50 to 57 pounds
 1 short ton = 35 to 40 cubic feet
 1 long ton = 39 to 45 cubic feet
Bituminous coal (piled loose):
 1 cubic foot = 44 to 54 pounds
 1 short ton = 37 to 45 cubic feet
 1 long ton = 42 to 51 cubic feet

Coke (piled loose):
 1 cubic foot = 23 to 32 pounds
 1 short ton = 62 to 87 cubic feet
 1 long ton = 70 to 97 cubic feet
Charcoal (of pine and oak):
 1 cubic foot = 15 to 30 pounds
Ice:
 1 cubic foot = 57 pounds
 1 pound = 30 cubic inches

Sugar, granulated:
 1 cup = 1/2 pound
Butter: 1 cup = 1/2 pound
Lard: 1 cup = 1/2 pound
Flour: 1 cup = 1/4 pound
Rice: 1 cup = 1/2 pound
Cornmeal: 1 cup = 5 ounces
Raisins (stemmed):
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COMMON RULES OF MEASUREMENT

Rectangle.....Area=length×width

Solid with rectangular sides...Volume=length×width×height

Circle:
 Circumference=3.1416×diameter
 Area=0.7854×diameter×diameter
Cylinder:
 Area (exclusive of that of ends)=3.1416×diameter×height
 Volume=0.7854×diameter×diameter×height

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The fundamental unit of the metric system is the METER (the unit of length). From this the units of mass (GRAM) and capacity (LITER) were derived. All other units are the decimal subdivisions or multiples of these. These three units are simply related, so that for all practical purposes the volume of one kilogram of water (one liter) is equal to one cubic decimeter.

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ARE	1.	"the unit of area"
MILLI-	.001	"the thousandth part of"
CENTI-	.01	"the hundredth part of"
DECI-	.1	"the tenth part of"
DEKA-	10.	"ten times"
HECTO-	100	"one hundred times"
KILO	1000	"one thousand times"

One meter = 39.37 inches (exactly); 1 liter = 1.06 quarts (nearly); 1 gram = 0.04 avoirdupois ounce (nearly).



HEIGHTS AND WEIGHTS OF CHILDREN

AGE	BOYS				GIRLS				AGE	BOYS				GIRLS			
	Height		Weight		Height		Weight			Height		Weight		Height		Weight	
yr. no. At birth	inches	centi-meters	lbs. oz.	kilograms	inches	centi-meters	lbs. oz.	kilograms	yr. no.	inches	centi-meters	lbs. oz.	kilograms	inches	centi-meters	lbs. oz.	kilograms
1	20 1/2	52.3	7 10	3.45	20 1/2	52.1	7 3	3.25	2	33 1/2	85.7	27 2	12.30	33 1/2	84.8	26 6	11.95
3	23 1/2	59.7	13	5.90	22	55.9	13 0	5.90	2	34 1/2	88.3	29 8	13.15	33 1/2	86.0	27 4	12.36
6	27 1/4	67.3	18	8.16	25 1/2	65.7	16 12	7.60	2	35 1/2	89.9	29 8	13.28	34 1/2	88.6	28 4	12.81
7	27 3/4	69.2	19 2	8.68	26 1/2	67.3	17 6	7.88	2	36 1/4	91.8	30 10	13.92	35 1/2	90.5	29 2	13.21
8	27 3/4	70.2	19 12	8.96	27	68.6	18 4	8.28	3	37 1/2	91.3	32 4	14.63	36 1/2	93.3	30 8	13.84
9	28 1/4	71.4	20 6	9.24	27 1/2	70.2	19 2	8.68	3	37 1/2	96.2	33 2	15.02	37 1/2	94.6	31 10	14.34
10	28 1/2	72.4	20 14	9.47	27 1/2	70.8	19 8	8.84	3	38 1/2	98.1	33 12	15.31	38	96.5	32 8	14.74
11	29	73.7	21 6	9.70	28 1/2	72.1	20 2	9.13	3	39	99.1	34 8	15.65	38 1/2	97.8	33 4	15.05
1	20 1/2	52.3	7 10	3.45	20 1/2	52.1	7 3	3.25	4	30 1/2	77.7	27 2	12.30	30 1/2	77.7	27 2	12.30
1 1	20 3/4	53.9	22 11	10.38	20 3/4	53.4	21 9	9.52	5	41 1/2	103.7	41 2	18.64	41 1/2	104.8	39 11	18.01
1 2	30 1/4	76.8	23	10.43	29 1/2	74.9	21 10	9.81	6	43 1/2	111.1	45 3	20.50	43 1/2	110.2	43 5	19.64
1 3	30 3/4	78.1	23 10	10.72	30 1/2	76.5	21 14	9.92	7	45 1/2	116.2	49 2	22.27	45 1/2	115.6	47 8	21.55
1 4	31 1/4	79.1	24 2	10.94	30 3/4	77.5	22 10	10.26	8	47 1/2	121.3	53 14	21.45	47 1/2	121.0	52	23.59
1 5	31 3/4	79.7	24 8	11.11	30 3/4	78.1	22 14	10.38	9	49 1/2	126.4	59 3	26.85	49 1/2	125.4	57 2	25.99
1 6	31 3/4	80.6	24 10	11.17	31 1/4	79.1	23 6	10.69	10	51 1/2	131.4	65 5	29.62	51 1/2	130.2	62 6	28.30
1 7	32 1/4	81.9	25 8	11.57	31 1/2	80.0	23 12	10.77	11	53 1/2	135.3	70 3	31.84	53 1/2	135.6	68 13	31.21
1 8	32 3/4	82.9	25 12	11.68	32	81.3	24 2	10.94	12	55 1/2	140.0	76 14	34.84	55 1/2	141.9	78 5	35.52
1 9	32 3/4	83.5	25 12	11.68	32 1/2	81.9	24 12	11.23	13	57 1/2	145.4	84 13	38.46	58 1/2	144.0	88 11	40.23
1 10	33 1/4	84.4	26 14	12.19	32 3/4	82.9	25 4	11.45	14	59 1/2	152.1	94 14	43.05	59 1/2	152.1	98 6	44.63
1 11	33 3/4	85.4	27	12.25	32 3/4	83.5	25 10	11.62	15	62 1/2	158.1	107 2	48.58	61 1/2	155.3	106 2	48.13
									16	65	165.1	121	54.88	61 1/2	156.5	112	50.90

The data for this table were furnished by the Children's Bureau, United States Department of Labor, and is collated from such leading authorities as Holt, Crum, Bowditch, and others. There is a variation in height and weight of healthy children of the same age which should be taken into account in using the above figures to judge normal development.

