

VARIATIONS IN TIME.

Washington, D. C.	12 00 m.	Denver, Col.	10 07 a. m.	Paris, France.	5 42 p. m.
Athens, Greece.	6 43 p. m.	Dublin, Ireland.	4 43 p. m.	Pekin, China.	12 54 a. m.
Auckland, New Zealand.	4 51 a. m.	Gibraltar, Spain.	4 51 p. m.	Philadelphia, Pa.	12 13 p. m.
Augusta, Me.	12 29 p. m.	Glasgow, Scotland.	4 51 p. m.	Pittsburg, Pa.	11 48 a. m.
Austin, Texas.	10 37 a. m.	Halifax, Nova Scotia.	12 54 p. m.	Rio Janeiro, Brazil.	2 16 p. m.
Batavia, Java.	12 15 a. m.	Harrisburg, Pa.	12 01 p. m.	Rome, Italy.	5 58 p. m.
Bombay, India.	10 00 p. m.	Lima, Peru.	12 00 m.	St. Louis, Mo.	11 07 a. m.
Boston, Mass.	12 24 p. m.	London, England.	5 07 p. m.	St. Petersburg, Russia.	7 09 p. m.
Berlin, Prussia.	6 01 p. m.	Madrid, Spain.	4 53 p. m.	Salt Lake City, Utah.	9 40 a. m.
Calcutta, India.	11 01 p. m.	Mecca, Arabia.	7 49 p. m.	San Francisco, Cal.	8 58 a. m.
Canton, China.	12 41 a. m.	Mexico, Mexico.	10 27 a. m.	Tallahassee, Fla.	11 30 a. m.
Charleston, S. C.	11 49 a. m.	New Orleans, La.	11 08 a. m.	Toronto, Canada.	11 51 a. m.
Chicago, Ill.	11 18 a. m.	New York, N. Y.	12 12 p. m.	Valparaiso, Chili.	12 21 p. m.
Constantinople, Turkey.	7 04 p. m.	Olympia, Washington Ter.	8 57 a. m.	Yeddo, Japan.	2 27 a. m.
Copenhagen, Denmark.	5 58 p. m.	Omaha, Neb.	10 44 a. m.		

THE ENGLISH MILE COMPARED WITH OTHER EUROPEAN MEASURES.

	ENGLISH STATUTE MILE.	ENGLISH GEOG. MILE.	FRENCH KILO-METRE.	GERMAN GEOG. MILE.	RUSSIAN VERST.	AUSTRIAN MILE.	DUTCH URE.	NOR-WEGIAN MILE.	SWEDISH MILE.	DANISH MILE.	SWISS STUNDE.
English Statute Mile.	1.000	1.153	1.609	0.217	1.508	0.212	0.289	0.142	0.151	0.213	0.335
English Geographical Mile.	1.153	1.000	1.855	0.250	1.738	0.245	0.333	0.164	0.169	0.246	0.386
Kilometre.	0.621	0.540	1.000	0.135	0.937	0.132	0.180	0.088	0.094	0.133	0.208
German Geographical Mile.	4.610	4.000	7.420	1.000	6.953	0.978	1.333	0.657	0.694	0.985	1.543
Russian Verst.	0.663	0.575	1.067	0.144	1.000	0.141	0.192	0.094	0.100	0.142	0.222
Austrian Mile.	4.714	4.089	7.586	1.022	7.112	1.000	1.363	0.672	0.710	1.006	1.578
Dutch Ure.	3.458	3.000	5.565	0.750	5.215	0.734	1.000	0.493	0.520	0.738	1.157
Norwegian Mile.	7.021	6.091	11.299	1.523	10.589	1.489	2.035	1.000	1.057	1.499	2.350
Swedish Mile.	6.644	5.764	10.692	1.441	10.010	1.409	1.921	0.948	1.000	1.419	2.224
Danish Mile.	4.682	4.062	7.536	1.016	7.078	0.994	1.354	0.667	0.705	1.000	1.567
Swiss Stunde.	2.987	2.592	4.808	0.648	4.505	0.634	0.864	0.425	0.449	0.638	1.000

LATITUDE AND LONGITUDE.

A TABLE SHOWING THE NUMBER OF MILES IN A DEGREE OF LONGITUDE AT EACH DEGREE OF LATITUDE.

LAT.	MILES.	LAT.	MILES.	LAT.	MILES.	LAT.	MILES.	LAT.	MILES.	LAT.	MILES.	LAT.	MILES.	LAT.	MILES.
1°	60	11°	58.9	21°	56.0	31°	51.4	41°	45.3	51°	37.8	61°	29.1	71°	19.5
2	60	12	58.7	22	55.6	32	50.9	42	44.6	52	36.9	62	28.2	72	18.5
3	59.9	13	58.5	23	55.2	33	50.3	43	43.9	53	36.1	63	27.2	73	17.5
4	59.9	14	58.2	24	54.8	34	49.7	44	42.4	54	35.3	64	26.3	74	16.5
5	59.8	15	58.0	25	54.4	35	49.1	45	42.4	55	34.4	65	25.4	75	15.5
6	59.7	16	57.7	26	53.9	36	48.5	46	41.7	56	33.6	66	24.4	76	14.5
7	59.6	17	57.4	27	53.5	37	47.9	47	40.9	57	32.7	67	23.4	77	13.5
8	59.4	18	57.1	28	53.0	38	47.3	48	40.1	58	31.8	68	22.5	78	12.5
9	59.3	19	56.7	29	52.5	39	46.6	49	39.4	59	30.9	69	21.5	79	11.4
10	59.1	20	56.4	30	52.0	40	46.0	50	38.6	60	30.0	70	20.5	80	10.4

MISCELLANEOUS ENGLISH WEIGHTS AND MEASURES.

MEASURES OF LENGTH.

	In.	Ft.	Ys.	Pls.	Ch.	Fs.
A Palm.	3					
A Hand.	4					
Foot.	12					
Yard.	36	3				
Rod, pole or perch.	198	16½	5½			
Chain.	792	66	22	4		
Furlong.	7,920	660	220	40	10	
Mile.	63,360	5,280	1,760	320	80	8

PARTICULAR MEASURES OF LENGTH.

- 12 lines 1 inch.
- 3 inches 1 palm.
- 4 inches 1 hand.
- A cubit 18 inches.
- A pace, military, 2 feet 6 inches.
- A pace, geometrical, 5 feet.
- A fathom 6 feet.
- A cable's length 240 yards.
- A degree 69½ miles = 60 nautical knots or geographical miles.
- A league 3 miles.

SQUARE OR SURFACE MEASURE.

	In.	Ft.	Yds.	Pls.	Ch.	R.
Square foot.	144	1				
Square yard.	1,296	9	1			
Rod, pole, or perch.	39,204	272½	30½	1		
Square chain.	627,264	4,356	484	16	1	
Rood.	1,568,160	10,890	1,210	40	2½	1
Acre.	6,272,640	43,560	4,840	160	10	4

A square mile contains 640 acres, 2,560 roods, 6,400 chains, 102,400 rods, poles, or perches, or 3,097,600 square yards.

APOTHECARIES' WEIGHTS AND MEASURES BY WHICH MEDICINES ARE COMPOUNDED.

20 Grains.	= 1 Scruple ℥	= 20 grs.
3 Scruples.	= 1 Drachm ℥	= 60 "
8 Drachms.	= 1 Ounce ℥	= 480 "
12 Ounces.	= 1 Pound ℔	= 5760 "

Drugs are purchased by Avoirdupois Weight.

FLUID MEASURE.

60 Minims ℥	= 1 Fluid Drachm	Marked f 3
8 Drachms	= 1 Ounce	f 3
20 Ounces	= 1 Pint	O
8 pints	= 1 Gallon	gai.

PARTICULAR WEIGHTS.

A Stone, Horseman's weight.	= 14 lbs.
A Firkin of Butter.	= 56 "
A Firkin of Soft Soap.	= 64 "
A Barrel of Raisins.	= 112 "
A Barrel (or pack) of Soft Soap.	= 256 "
A Fodder of Lead, London and Hull.	= 19½ cwt.
" " Derby.	= 22½ "
" " Newcastle.	= 21½ "

A Sack—Potatoes, 168 lbs.; Coals, 224 lbs.; Flour, 280 lbs.

MISCELLANEOUS ENGLISH WEIGHTS AND MEASURES—Continued.

MEASURES OF TIME.

60 Seconds.....	= 1 Minute.
60 Minutes.....	= 1 Hour.
24 Hours.....	= 1 Day.
7 Days.....	= 1 Week.
28 Days.....	= 1 Lunar Month.
28, 29, 30, or 31 Days.....	= 1 Calendar Month.
12 Calendar Months.....	= 1 Year.
365 Days.....	= 1 Common Year.
366 Days.....	= 1 Leap Year.

ANGULAR MEASURE.

60 Seconds.....	= 1 Minute.
60 Minutes.....	= 1 Degree.
30 Degrees.....	= 1 Sign.
90 Degrees.....	= 1 Quadrant.
4 Quadrants, or 360°.....	= 1 Circumference, or Great Circle.

CUBIC OR SOLID MEASURE.

1728 Cubic Inches.....	= 1 Cubic Foot.
27 Cubic Feet.....	= 1 Cubic Yard.
40 Do. of Rough, or.....	} = 1 Ton or Load.
50 Do. of Hewn Timber.....	
42 Cubic Feet of Timber.....	= 1 Shipping Ton.
108 Cubic Feet.....	= 1 Stack of Wood.
128 Cubic Feet.....	= 1 Cord of Wood.
40 Cubic Feet.....	= 1 Ton Shipping.

LIQUID MEASURE.

	Gals.	Qts.	Pts.
Four Gills, one Pint.....	1
Quart.....	..	1	2
Gallon.....	1	4	8
Firkin or Quarter Barrel.....	9	36	72
Kilderkin or Half Barrel.....	18	72	144
Barrel.....	36	144	288
Hogshead of Ale (1½ barrel).....	54	216	432
Puncheon.....	72	288	576
Butt of Ale (3 barrels).....	108	432	864

Practically, the only measures in use are gallons and quarts, the others are merely nominal; *e. g.*, the hogshead of 54 gallons, *old measure*, contains but 52 gallons, 1 quart, 1 pint, and 3.55 gills imperial measure, and of wine six nominal quart bottles go to the gallon. Of imported wines the following are the usual measurements:

Pipe of Port or Masdeu.....	= 115 Gallons.
" Teneriffe.....	= 109 "

Pipe of Marsala.....	= 93 Gallons
Madeira and Cape.....	= 92 "
Butt of Lisbon and Bucellas.....	= 117 "
Sherry and Tent.....	= 108 "
Aum of Hock and Rhenish.....	= 30 "
Hogshead of Claret.....	= 46 "

DRY OR CORN MEASURE.

4 Quarts.....	= 1 Gallon.
2 Gallons.....	= 1 Peck.
4 Pecks.....	= 1 Bushel.
3 Bushels (four of corn).....	= 1 Sack.
12 Sacks.....	= 1 Chaldron.
8 Bushels, or two sacks.....	= 1 Quarter.
5 Quarters.....	= 1 Load.

MEASURES OF WEIGHT.—AVOIRDUPOIS.

27½ Grains.....	= 1 Drachm = 27½	} Grains.
16 Drachms.....	= 1 Ounce = 437½	
16 Ounces.....	= 1 Pound = 7000	} Grains.
8 Pounds.....	= 1 Stone of Butcher's Meat.	
14 Pounds.....	= 1 Ordinary Stone.	
28 Pounds.....	= 1 Quarter (qr.).	
4 Quarters.....	= 1 Hundredweight (cwt.).	
20 Cwt.....	= 1 Ton.	

This weight is used in almost all commercial transactions, and common dealings.

TROY WEIGHT.

3⅞ Grains.....	= 1 Carat.
24 Grains.....	= 1 Pennyweight.
20 Pennyweights.....	= 1 Ounce = 480 grs.
12 Ounces.....	= 1 Pound = 5760 "

HAY AND STRAW.

Truss of Straw, 36 lb.	
Truss of Old Hay, 56 lb.	
Truss of New Hay, 60 lb.	
Load, 36 Trusses = Straw, 11 cwt. 2 qrs. 8 lb.; Old Hay, 18 cwt.; New Hay, 19 cwt. 1 qr. 4 lb.	

WOOL.

		cwt.	qr.	lb.
7 Pounds.....	= 1 Clove.....	0	0	7
2 Cloves.....	= 1 Stone.....	0	0	14
2 Stones.....	= 1 Tod.....	0	1	0
6½ Tods.....	= 1 Wey.....	1	2	14
12 Sacks.....	= 1 Last.....	39	0	0

FRENCH METRICAL SYSTEM OF WEIGHTS AND MEASURES.

The Metrical System is based upon the length of the fourth part of a terrestrial meridian. The ten-millionth part of this arc was chosen as the unit of measures of length, and called *Mètre*. The cube of the tenth part of the *mètre* was adopted as the unit of capacity, and denominated *Litre*. The weight of a litre of distilled water at its greatest density

was called *Kilogramme*, of which the thousandth part, or *Gramme*, was adopted as the unit of weight. The multiples of these proceeding in decimal progression are distinguished by the employment of the prefixes *deca*, *hecto*, *kilo*, and *myria*, from the Greek, and the subdivisions by *deci*, *centi*, and *milli*, from the Latin:—

MEASURES OF LENGTH (UNIT MÈTRE).

EQUAL TO	Inches.	Feet.	Yards.	Fathoms.	Miles.
Millimètre.....	0.03937 ..	0.003281 ..	0.0010936 ..	0.0005468 ..	0.000006
Centimètre.....	0.39371 ..	0.032809 ..	0.0109363 ..	0.0054682 ..	0.000062
Décimètre.....	3.93708 ..	0.328090 ..	0.1093633 ..	0.0546816 ..	0.000621
MÈTRE.....	39.37079 ..	3.280989 ..	1.0936331 ..	0.5468165 ..	0.006214
Décamètre.....	393.70790 ..	32.809892 ..	10.9363306 ..	5.4681653 ..	0.0062138
Hectomètre.....	3937.07900 ..	328.09917 ..	109.3633056 ..	54.6816528 ..	0.0621382
Kilomètre.....	39370.79000 ..	3280.899167 ..	1093.6330556 ..	546.8165278 ..	0.6213824
Myriamètre.....	393707.90000 ..	32808.991667 ..	10936.3305556 ..	5468.1652778 ..	6.2138242

CUBIC, OR MEASURES OF CAPACITY (UNIT LITRE).

EQUAL TO	Cubic Inches.	Cubic Feet.	Pints.	Gallons.	Bushels.
Millilitre, or cubic centimètre.....	0.06103 ..	0.00035 ..	0.00176 ..	0.0002201 ..	0.0000275
Centilitre, 10 cubic do.....	0.61027 ..	0.000353 ..	0.01761 ..	0.0022010 ..	0.0002751
Décilitre, 100 cubic do.....	6.10271 ..	0.003532 ..	0.17608 ..	0.0220007 ..	0.0027512
LITRE, or cubic Décimètre.....	61.02705 ..	0.023517 ..	1.76077 ..	0.2200967 ..	0.0027512
Décalitre, or Centistère.....	610.27052 ..	0.353166 ..	17.60773 ..	2.2009668 ..	0.2751208
Hectolitre, or Décistère.....	6102.70515 ..	3.531658 ..	176.07734 ..	22.0096677 ..	2.7512085
Kilolitre, or Stère, or cubic mètre.....	61027.05152 ..	35.316581 ..	1760.77341 ..	220.0966767 ..	27.5120840
Myrialitre, or Décastère.....	610270.51519 ..	353.165807 ..	17607.73414 ..	2200.9667675 ..	275.1208459

MEASURES OF WEIGHT (UNIT GRAMME).

EQUAL TO	Grains.	Troy Oz.	Avoirdupois lb.	Cwt. = 112 lb.	Tons = 20 cwt.
Milligramme.....	0.01543 ..	0.00032 ..	0.000022 ..	0.0000000 ..	0.0000000
Centigramme.....	0.15432 ..	0.000322 ..	0.0000220 ..	0.0000002 ..	0.0000000
Déigramme.....	1.54323 ..	0.003215 ..	0.0002205 ..	0.0000020 ..	0.0000001
GRAMME.....	15.43235 ..	0.0232151 ..	0.0022046 ..	0.0000197 ..	0.0000010
Déagramme.....	154.32349 ..	0.321597 ..	0.0220462 ..	0.0001968 ..	0.0000098
Hectogramme.....	1543.23488 ..	3.215973 ..	0.2204621 ..	0.0019684 ..	0.0000984
Kilogramme.....	15432.34880 ..	32.159727 ..	2.2046213 ..	0.0196841 ..	0.0009842
Myriagramme.....	154323.48800 ..	321.597267 ..	22.0462126 ..	0.1968412 ..	0.0098421

SQUARE, OR MEASURES OF SURFACE (UNIT ARE).

EQUAL TO	Sq. Feet.	Sq. Yards.	Sq. Perches.	Sq. Rods.	Sq. Acres.
Centiare, or square mètre.....	10.764299 ..	1.196033 ..	0.0395383 ..	0.0009885 ..	0.0002471
ARE, or 100 square mètres.....	1076.429934 ..	119.603326 ..	3.9538290 ..	0.0988457 ..	0.0247114
Hectare, or 10,000 square mètres.....	107642.993419 ..	11960.332602 ..	395.3828959 ..	9.8845724 ..	2.4711431