

5. A laborer was employed for 5 months, at \$27.50 per month; he received, each month, \$12.25 in cash and \$9.75 in groceries: at the end of the time, what had he saved?

6. A poor man bought a barrel of flour for \$6.50; 7 pounds of sugar, at 9 cents per pound; 28 pounds of Indian meal, at 3 cents per pound; 4 pounds of butter, at $23\frac{1}{2}$ cents per pound; and 15 pounds of ham, at 9 cents per pound; he paid \$5 in cash, and agreed to pay for the remainder in labor at \$1.25 per day: how many days must he labor?

7. If I pay \$96 for 25 hats, how much must I pay for 63 hats at the same rate?

8. If 36 men can be hired for \$50.40 for one day, how many men could be hired for the same time for \$133.00?

9. Find $\frac{7}{8}$ of 679 dollars 19 cents 6 mills.

10. A war-vessel captured a prize, which was afterwards sold for \$37650; $\frac{4}{5}$ of this sum was to be equally divided among 250 men: what was the share of each man?

11. How much is $\frac{1}{12}$ of \$56412.60?

12. In how many weeks could a father and son together earn \$65.75, if the father earns \$10.60 and the son \$3.75, per week?

13. A family, consisting of father, mother, and 4 children, desires to board in the country during the summer, and can afford to pay \$162: how many weeks can they remain, if the board of each parent is \$4.50, and of each child \$2.25?

14. A gentleman bought a farm of 160 acres, at \$75 per acre, and sold it for \$19000: what was the entire gain, and how much per acre?

15. If a merchant buys coal at the rate of \$3.75, and sells it at \$5 per ton, how many tons must he sell in order to gain \$1500?

DENOMINATE NUMBERS.

110. An **ABSTRACT NUMBER** is one whose unit is not named.

111. A **DENOMINATE NUMBER** is one whose unit is named, as 3 pounds, 4 horses, &c.

112. A **SIMPLE NUMBER** is a collection of units of the same kind, whether abstract or denominate.

113. A **COMPOUND DENOMINATE NUMBER** is one expressed by two or more denominations.

114. A **SCALE** is a series of numbers expressing the law of relation between the different units of any number.

Kinds of Units.

There are eight different Units of Arithmetic:

- I. UNITS OF ABSTRACT NUMBER;
- II. UNITS OF CURRENCY;
- III. UNITS OF LENGTH;
- IV. UNITS OF SURFACE;
- V. UNITS OF VOLUME, OR CAPACITY;
- VI. UNITS OF WEIGHT;
- VII. UNITS OF TIME;
- VIII. UNITS OF CIRCULAR MEASURE.

I. ABSTRACT NUMBERS.

Table.

10 Units	. . . . .	make	1 Ten.
10 Tens	. . . . .		1 Hundred.
10 Hundred	. . . . .		1 Thousand.
10 Thousand	. . . . .		1 Ten-thousand.
&c.			&c.

Table Reversed.

	Thous.	Hund.	Ten.	Units.
		1 =	10 =	100.
	1 =	10 =	100 =	1000.
Ten-thous.	1 =	10 =	100 =	1000.
	1 =	10 =	100 =	1000 = 10000.

SCALE.—The *steps*, or units of the scale, are all equal, and each 10: hence, the scale is uniform.

II. CURRENCY.

I. UNITED STATES CURRENCY.

115. The United States Currency is the Decimal Currency established by a law of Congress.

Table.

10 Mills (<i>m.</i>) . . .	make	1 Cent,	. . .	marked	<i>ct.</i>
10 Cents		1 Dime,	. . . . .		<i>d.</i>
10 Dimes		1 Dollar,	. . . . .		<i>£.</i>
10 Dollars		1 Eagle,	. . . . .		<i>E.</i>

Table Reversed.

	<i>£.</i>	<i>d.</i>	<i>ct.</i>	<i>m.</i>
		1 =	10 =	100.
	1 =	10 =	100 =	1000.
E.	1 =	10 =	100 =	1000.
	1 =	10 =	100 =	1000 = 10000.

SCALE.—The steps of the scale are each 10: hence, the scale is uniform.

II. ENGLISH CURRENCY.

116. English Currency is the Currency of Great Britain.

Table.

4 Farthings (<i>far.</i>)	make	1 Penny,	. . .	marked	<i>d.</i>
12 Pence		1 Shilling			<i>s.</i>
20 Shillings		1 Pound, or sovereign,	<i>£</i>		
21 Shillings		1 Guinea.			

Table Reversed.

	<i>£</i>	<i>s.</i>	<i>d.</i>	<i>far.</i>
			1 =	4.
		1 =	12 =	48.
	1 =	20 =	240 =	960.

NOTES.—1. The steps, or units of the scale, beginning at the lowest, are 4, 12, and 20. If we begin at the highest unit, the order is reversed, and the units are 20, 12, and 4. The step or connecting link between any two denominations, is, however, the same in both cases.

2. The steps of the scale are equal only in abstract and decimal numbers: hence, these numbers alone have uniform scales.

3. Farthings are generally expressed in fractions of a penny: Thus, 1far. = $\frac{1}{4}$ d.; 2far. = $\frac{1}{2}$ d.; 3far. = $\frac{3}{4}$ d.

3. By reading the second table from left to right, we can see the value of any unit expressed in each of the lower denominations. Thus, 1d. = 4far.; 1s. = 12d. = 48far.; $\text{£}1 = 20\text{s.} = 240\text{d.} = 960\text{far.}$

III. UNITS OF LENGTH.

I. LONG MEASURE.

117. This Measure is used to measure distances, lengths, breadths, heights, depths, &c.

Table.

12 Inches (<i>in.</i>) . . .	make	1 Foot,	. . .	marked	<i>ft.</i>
3 Feet		1 Yard,	. . . . .		<i>yd.</i>
5½ Yards, or 16½ Feet		1 Rod,	. . . . .		<i>rd.</i>
40 Rods		1 Furlong,	. . . . .		<i>fur.</i>
8 Furlongs, or 320 Rods		1 Mile,	. . . . .		<i>mi.</i>
3 Miles		1 League,	. . . . .		<i>L.</i>
69½ Statute Miles (nearly), or } 60 Geographical Miles }		1 Degree of the } Equator, }			<i>deg. or °</i>
360 Degrees		a Circumference of the Earth.			

Table Reversed.

		yd.	ft.	in.						
		1	=	36						
	rd.	1	=	3						
		1	=	5 $\frac{1}{2}$						
	fur.	1	=	16 $\frac{1}{2}$						
		1	=	198						
mi.	1	=	40	=	220	=	660	=	7920	
1	=	8	=	320	=	1760	=	5280	=	63360

NOTES.—1. A fathom is a length of six feet, and is generally used to measure the depth of water. A pace is three feet.

2. A hand is 4 inches, used to measure the height of horses.

3. SCALE.—The steps, or units of the scale, beginning at the lowest, are 12, 3, 5 $\frac{1}{2}$, 40, and 8.

4. The geographical mile is equal to a minute of one of the great circles of the earth.

II. SURVEYORS' MEASURE.

118. The Surveyors' or Gunter's Chain is generally used in surveying land. It is 4 rods, or 66 feet in length, and is divided into 100 links.

Table.

7.92 Inches	. . .	make	1 Link,	. . .	marked	<i>l</i> .
100 Links, or 66 feet,			1 Chain,	. . .		<i>c</i> .
80 Chains	. . .		1 Mile,	. . .		<i>mi</i> .

Table Reversed.

		l.	ft.	in.					
		1	=	7.92					
	c.	1	=	66					
		1	=	100					
m.	1	=	80	=	5280	=	8000	=	63360

SCALE.—The steps, or units of the scale, beginning at the lowest, are 7.92, 100, and 80.

III. CLOTH MEASURE.

119. CLOTH MEASURE is used for measuring all kinds of cloth, ribbons, and other things sold by the yard.

Table.

2 $\frac{1}{4}$ Inches (<i>in.</i>)	. . .	make	1 Nail,	. . .	marked	<i>na.</i>
4 Nails	. . .		1 Quarter of a yard	. . .		<i>qr.</i>
3 Quarters	. . .		1 Ell Flemish,	. . .		<i>E. Fl.</i>
4 Quarters	. . .		1 Yard,	. . .		<i>yd.</i>
5 Quarters	. . .		1 Ell English	. . .		<i>E. E.</i>
6 Quarters	. . .		1 Ell French	. . .		<i>E. F.</i>

Table Reversed.

		yd.	qr.	na.	in.	
		1	=	4	=	2 $\frac{1}{4}$
	E. Fl.	1	=	16	=	36
		1	=	3	=	12
	E. E.	1	=	1 $\frac{3}{4}$	=	27
		1	=	5	=	20
E. F.	1	=	1 $\frac{1}{4}$	=	45	
1	=	1 $\frac{1}{2}$	=	2	=	1 $\frac{1}{2}$
		1	=	6	=	24
		1	=	24	=	54

SCALE.—1. The steps, or units of the scale, beginning at the lowest, and then reckoning from the quarter-yard, are 2 $\frac{1}{4}$, 4, 4, 3, 5, and 6.

2. The yard of Cloth Measure, is the yard of Long Measure, and is equal to 36 inches.

IV. UNITS OF SURFACE.

I. SQUARE MEASURE.

120. SQUARE MEASURE is used in measuring surfaces, which combine length and breadth.

The unit of this measure, is a square, constructed on the unit of length.

A square, is a figure bounded by four equal sides, at right angles to each other. If each side be one foot, the figure is called, a *square foot*.

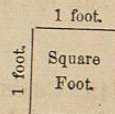


Table.

144 Square Inches (<i>sq. in.</i>)	make	1 Square Foot,	marked <i>sq. ft.</i>
9 Square Feet		1 Square Yard,	<i>sq. yd.</i>
30 $\frac{1}{4}$ Square Yards		1 Square Rod, or Perch,	<i>P.</i>
40 Square Rods or Perches		1 Rood,	<i>R.</i>
4 Roods		1 Acre,	<i>A.</i>
640 Acres		1 Square Mile	<i>M.</i>

Table Reversed.

		sq. ft.	sq. in.
	sq. yd.	1 =	144.
	P.	1 =	9 = 1296.
R.	1 =	30 $\frac{1}{4}$ =	272 $\frac{1}{4}$ = 39204.
A.	1 =	40 = 1210 =	10890 = 1568160.
	1 =	4 = 160 =	4840 = 43560 = 6272640.

SCALE.—The steps, or units of the scale, beginning at the lowest, are 144, 9, 30 $\frac{1}{4}$, 40, and 4.

II. SURVEYORS' MEASURE.

121. Surveyors estimate the area of land in Square Miles, Acres, Roods, and Perches.

Table.

16 Perches (<i>P.</i>)	make	1 Square Chain,	<i>sq. ch.</i>
40 Perches, or 2 $\frac{1}{2}$ Square Chains		1 Rood,	<i>R.</i>
4 Roods		1 Acre,	<i>A.</i>
640 Acres		1 Square Mile,	<i>sq. mi.</i>

Table Reversed.

		sq. ch.	P.
	R.	1 =	16.
	A.	1 =	2 $\frac{1}{2}$ = 40.
sq. mi.	1 =	4 = 10 =	160.
	1 =	640 = 2560 =	6400 = 10240.

SCALE.—The steps, or units of the scale, beginning at the lowest, are 16, 2 $\frac{1}{2}$, 4, and 640.

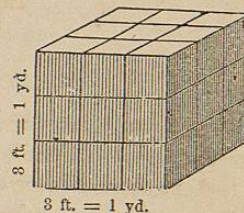
V. UNITS OF VOLUME OR CAPACITY.

I. CUBIC MEASURE.

122. CUBIC MEASURE is used for measuring solids; as stone, timber, earth, and other things, in which the three dimensions of length, breadth, and thickness, are considered.

The unit of this measure is a cube whose edge is the unit of length.

A cube is a figure bounded by six equal squares, called *faces*; the sides of the square are called *edges*.



A cubic foot is a cube, each of whose faces is a square foot; its edges are each 1 foot.

A cubic yard is a cube, each of whose edges is 1 yard.

Table.

1728 Cubic Inches (<i>cu. in.</i>)	make	1 Cubic Foot,	marked <i>cu. ft.</i>
27 Cubic Feet		1 Cubic Yard,	<i>cu. yd.</i>
40 Feet of round, or	}	1 Ton,	<i>T.</i>
50 Feet of hewn Timber,			
42 Cubic Feet		1 Ton of Shipping,	<i>T.</i>
16 Cubic Feet		1 Cord Foot,	<i>c. ft.</i>
8 Cord Feet, or	}	1 Cord,	<i>C.</i>
128 Cubic Feet,			

NOTES.—1. A cord of wood is a pile 4 feet wide, 4 feet high, and 8 feet long.

2. A cord foot is 1 foot in length of the pile which makes a cord.

3. A ton of *round timber*, when square, is supposed to produce 40 cubic feet; hence, *one-fifth is lost by squaring*.

Table Reversed.

			Cu. ft.	cu. in.
		C. ft.	1 =	1728.
		Cu. yd.	1 =	16 = 27648.
	T. rd. T.	1 =	27 =	46656.
	T. hewn T.	1 =	21½ =	40 = 69120.
	T. ship.	1 =	31⅞ =	50 = 86400.
Cord.	1	=	2⅝ =	42 = 72576.
1	=	3 =	128 =	221184.

II. LIQUID MEASURE.

123. LIQUID MEASURE is used for measuring all liquids. Formerly some of them were measured by Beer Measure; but that measure is now not much used.

Table.

4 Gills (<i>gi.</i>)	make 1 Pint,	. . . . .	marked <i>pt.</i>
2 Pints	1 Quart,	. . . . .	<i>qt.</i>
4 Quarts	1 Gallon,	. . . . .	<i>gal.</i>
31½ Gallons	1 Barrel,	. . . . .	<i>bar. or bbl.</i>
2 Barrels, or 63 Gallons	1 Hogshead,	. . . . .	<i>hhd.</i>
2 Hogsheads	1 Pipe,	. . . . .	<i>pi.</i>
2 Pipes	1 Tun,	. . . . .	<i>tun.</i>

Table Reversed.

			pt.	qt.	gal.
			1 =	2 =	4 =
		gal.	1 =	4 =	8 =
	bar.	1 =	4 =	8 =	32 =
	hhd.	1 =	31½ =	126 =	252 = 1008 =
	pi.	1 =	2 =	63 =	252 = 504 = 2016 =
tun.	1 =	2 =	4 =	126 =	504 = 1008 = 4032 =
1 =	2 =	4 =	8 =	252 =	1008 = 2016 = 8064 =

NOTE.—The *standard unit*, or gallon of Liquid Measure, in the United States, contains 231 cubic inches.

III. DRY MEASURE.

124. DRY MEASURE is used in measuring all dry articles, such as grain, fruit, salt, coal, &c.

Table.

2 Pints (<i>pt.</i>)	make 1 Quart,	. . . . .	marked <i>qt.</i>
8 Quarts	1 Peck,	. . . . .	<i>pk.</i>
4 Pecks	1 Bushel,	. . . . .	<i>bu.</i>
36 Bushels	1 Chaldron,	. . . . .	<i>ch.</i>

Table Reversed.

			qt.	pt.
		pk.	1 =	2.
	bu.	1 =	8 =	16.
ch.	1 =	4 =	32 =	64.
1 =	36 =	144 =	1152 =	2304.

SCALE.—The steps, or units of the scale, beginning with the lowest, are 2, 8, 4, and 36.

NOTES.—1. The standard bushel of the United States is the Winchester bushel of England. It is a circular measure, 18½ inches in diameter and 8 inches deep, and contains 2150⅓ cubic inches, nearly.

2. A gallon, Dry Measure, contains 268½ cubic inches.

VI. UNITS OF WEIGHT.

I. AVOIRDUPOIS WEIGHT.

125. By this weight all articles are weighed, except gold, silver, jewels, and liquors.

Table.

16 Drams (<i>dr.</i>)	make 1 Ounce,	. . . . .	marked <i>oz.</i>
16 Ounces	1 Pound,	. . . . .	<i>lb.</i>
25 Pounds	1 Quarter,	. . . . .	<i>qr.</i>
4 Quarters	1 Hundredweight,	. . . . .	<i>cwt.</i>
20 Hundredweight	1 Ton,	. . . . .	<i>T.</i>

Table Reversed.

			oz.	dr.
		lb.	1 =	16.
	qr.	1 =	16 =	256.
	cwt.	1 =	25 =	400 =
τ	1 =	4 =	100 =	1600 =
1 =	20 =	80 =	2000 =	32000 =
				512000.

SCALE.—The steps, or units of the scale, beginning with the lowest, are 16, 16, 25, 4, and 20.

NOTES.—1. The standard Avoirdupois pound is the weight of 27.7015 cubic inches of distilled water.

2. By the old method of weighing, adopted from the English system, 112 pounds were reckoned for a hundredweight; but now, the laws of most of the States, as well as general usage, fix the hundredweight at 100 pounds.

3. A ton of coal at the mines, is reckoned at 2240 lbs., but at the yards, at 2000 lbs.

II. TROY WEIGHT.

126. Gold, silver, jewels, and liquors, are weighed by Troy weight.

Table.

24 Grains (<i>gr.</i>)	. make	1 Pennyweight,	marked	<i>pwt.</i>
20 Pennyweights	. . .	1 Ounce,	. . .	<i>oz.</i>
12 Ounces	. . .	1 Pound,	. . .	<i>lb.</i>

Table Reversed.

		pwt.	gr.
		1 =	24.
lb.	1 =	20 =	480.
1 =	12 =	240 =	5760.

SCALE.—The steps, or units of the scale, beginning with the lowest, are 24, 20, and 12.

NOTE.—The standard Troy pound is the weight of 22.794377 cubic inches of distilled water. It is less than the pound Avoirdupois.

III. APOTHECARIES' WEIGHT.

127. This weight is used by apothecaries and physicians in mixing their medicines. But medicines are generally sold, in the quantity, by avoirdupois weight.

Table.

20 Grains (<i>gr.</i>)	. make	1 Scruple,	. marked	ϑ.
3 Scruples	. . .	1 Dram,	. . .	ʒ.
8 Drams	. . .	1 Ounce,	. . .	℥.
12 Ounces	. . .	1 Pound,	. . .	lb.

Table Reversed.

			ϑ	gr.
		3	1 =	20.
	ʒ	1 =	3 =	60.
lb	1 =	8 =	24 =	480.
1 =	12 =	96 =	288 =	5760.

SCALE.—The steps, or units of the scale, beginning with the lowest, are 20, 3, 8, and 12.

NOTE.—The pound and ounce are the same as the pound and ounce in Troy weight.

VII. UNITS OF TIME.

128. Time is a part of duration. The time in which the earth revolves on its axis is called a *day*. The time in which it goes round the sun is 365 days and 6 hours, nearly, and is called a *solar year*.

Time is divided into parts according to the following

Table.

60 Seconds (<i>sec.</i>)	make	1 Minute,	marked	<i>m.</i>
60 Minutes	.	1 Hour,	.	<i>hr.</i>
24 Hours	.	1 Day,	.	<i>da.</i>
7 Days	.	1 Week,	.	<i>wk.</i>
52 Weeks (nearly)	.	1 Year,	.	<i>yr.</i>
365 Days	.	1 Common Year,	.	<i>yr.</i>
366 Days	.	1 Leap Year,	.	<i>yr.</i>
12 Calendar Months	.	1 Year,	.	<i>yr.</i>
100 Years	.	1 Century	.	<i>C.</i>

Table Reversed.

		<i>m.</i>		<i>sec.</i>
	<i>hr.</i>	1 =		60.
	<i>da.</i>	1 =	60 =	360.
	<i>wk.</i>	1 =	24 = 1440 =	86400.
		1 = 7 =	168 = 10080 =	604800.
<i>yr.</i>	<i>m.</i>	}	365 = 8760 = 525600 =	31536000.
1 = 12			366 = 8784 = 527040 =	31622400.

SCALE.—The steps, or units of the scale, beginning with the lowest, are 60, 60, 24, 7, 52, and 12.

Calendar Year.

WINTER,	{	1st Month, January,	has	31 days.
		2d " February,	"	28 or 29 days.
		3d " March,	"	31 days.
SPRING,	{	4th " April,	"	30 days.
		5th " May,	"	31 days.
SUMMER,	{	6th " June,	"	30 days.
		7th " July,	"	31 days.
		8th " August,	"	31 days.
AUTUMN,	{	9th " September,	"	30 days.
		10th " October,	"	31 days.
		11th " November,	"	30 days.
WINTER,	{	12th " December,	"	31 days.

365 days in a year.

NOTES.—1. The years are numbered from the beginning of the Christian Era. The year is divided into 12 calendar months, numbered from January; the days are numbered from the beginning of the month: hours from 12 at night and 12 at noon.

2. The length of the solar year is 365 da. 5 hr. 48 m. 48 sec., nearly; but it is reckoned at 365 days 6 hours.

3. Since the length of the year is computed at 365 days and 6 hours, the odd 6 hours, by accumulating for 4 years, make 1 day, so that every fourth year contains 366 days. This is called Bissextile or Leap Year. The leap years are exactly divisible by 4: 1864, 1868, 1872, 1876 will be leap years.

4. The additional day, when it occurs, is added to the month of February, so that this month has 29 days in the leap year.

Thirty days hath September,
April, June, and November;
All the rest have thirty-one,
Excepting February, twenty-eight alone.

VIII. CIRCULAR MEASURE.

129. CIRCULAR MEASURE is used in estimating latitude and longitude, and also in measuring the motions of the heavenly bodies.

The circumference of every circle is supposed to be divided into 360 equal parts, called *degrees*. Each degree is divided into 60 minutes, and each minute into 60 seconds.

Table.

60 Seconds (")	make	1 Minute,	marked	'.
60 Minutes	.	1 Degree,	.	°.
15 Degrees	.	1 Hour Angle,	.	<i>hr. an.</i>
30 Degrees	.	1 Sign,	.	<i>s.</i>
12 Signs, or 360 Degrees.	.	1 Circle,	.	<i>c.</i>

Table Reversed.

		°	1 =	60.
	<i>hr. an.</i>	1 =	60 =	3600.
	<i>s.</i>	1 = 15 =	900 =	54000.
<i>c.</i>	1 = 2 =	30 = 1800 =	108000.	
1 = 12 =	24 = 360 =	21600 =	1296000.	

SCALE.—The steps, or units of the scale, beginning at the lowest, are 60, 60, 15, 30, and 12.

Miscellaneous Tables.

COUNTING.

12 Units, or things,	make	1 Dozen.
12 Dozen		1 Gross.
12 Gross		1 Great Gross.
20 Things		1 Score.

LENGTH.

18 Inches		1 Cubit.
22 Inches, nearly,		1 Sacred Cubit.

WEIGHT.

100 Pounds		1 Quintal of fish.
196 Pounds		1 Barrel of flour.
200 Pounds		1 Barrel of pork.
14 Pounds of iron or lead		1 Stone.
21½ Stones		1 Pig.
8 Pigs		1 Fother.

PAPER.

24 Sheets		1 Quire.
20 Quires		1 Ream.
2 Reams		1 Bundle.
2 or more Bundles		1 Bale.

BOOKS.

The terms *folio*, *quarto*, *octavo*, *duodecimo*, &c., indicate the number of leaves into which a sheet of paper is folded.

A sheet folded in 2 leaves, is called a folio.	
A sheet folded in 4 leaves,	a quarto, or 4to.
A sheet folded in 8 leaves,	an octavo, or 8vo.
A sheet folded in 12 leaves,	a 12mo.
A sheet folded in 16 leaves,	a 16mo.
A sheet folded in 18 leaves,	an 18mo.
A sheet folded in 24 leaves,	a 24mo.
A sheet folded in 32 leaves,	a 32mo.

Aliquot Parts.

130. AN ALIQUOT PART of a number, is any part that will divide the number without a remainder.

Aliquot Parts of One Dollar.

50 cents = $\frac{1}{2}$ of 1 dollar.	12½ cents = $\frac{1}{8}$ of 1 dollar.
33⅓ cents = $\frac{1}{3}$ of 1 dollar.	10 cents = $\frac{1}{10}$ of 1 dollar.
25 cents = $\frac{1}{4}$ of 1 dollar.	8⅓ cents = $\frac{1}{12}$ of 1 dollar.
20 cents = $\frac{1}{5}$ of 1 dollar.	6¼ cents = $\frac{1}{16}$ of 1 dollar.
16⅔ cents = $\frac{1}{6}$ of 1 dollar.	5 cents = $\frac{1}{20}$ of 1 dollar.

Aliquot Parts of Time.

6 months = $\frac{1}{2}$ of 1 year.	15 days = $\frac{1}{2}$ of 1 month.
4 months = $\frac{1}{3}$ of 1 year.	10 days = $\frac{1}{3}$ of 1 month.
3 months = $\frac{1}{4}$ of 1 year.	6 days = $\frac{1}{4}$ of 1 month.
2 months = $\frac{1}{6}$ of 1 year.	5 days = $\frac{1}{6}$ of 1 month.
1 month = $\frac{1}{12}$ of 1 year.	1 day = $\frac{1}{30}$ of 1 month.

REDUCTION.

131. REDUCTION is the operation of changing the unit of a number, without altering the value of the number.

132. REDUCTION DESCENDING is the operation of changing the unit from one of a greater to one of a less value.

133. REDUCTION ASCENDING is the operation of changing the unit from one of a less to one of a greater value.

Reduction Descending.

1. Reduce £25 16s. and 6d. to pence.

Rule.

I. Multiply the number in the highest denomination by the units of the scale which connect it with the next lower, and add to the product the units of that denomination, if any.

OPERATION.

$$\begin{array}{r} \text{£} 25 \quad 16 \text{ s.} \quad 6 \text{ d.} \\ \quad \quad \quad 20 \\ \hline \quad \quad \quad 516 \text{ s.} \\ \quad \quad \quad \quad 12 \\ \hline \end{array}$$

Ans. 6198 d.

II. Proceed with this result, in the same manner, through all the denominations, until the required denomination is reached.

Examples.

1. Reduce 3 bu. 3 pk. 2 qt. to pints.

OPERATION.

$$\begin{array}{r} 3 \text{ bu.} \quad 3 \text{ pk.} \quad 2 \text{ qt.} \\ \quad \quad \quad 4 \\ \hline \quad \quad 15 \text{ pk.} \\ \quad \quad \quad 8 \\ \hline 122 \text{ qt.} \\ \quad \quad 2 \\ \hline \end{array}$$

244 pints, *Answer.*

2. In 5 da. 6 hr. 30 min., how many seconds?

OPERATION.

$$\begin{array}{r} 5 \text{ da.} \quad 6 \text{ hr.} \quad 30 \text{ min.} \\ \quad \quad \quad 24 \\ \hline 126 \\ \quad \quad 60 \\ \hline \end{array}$$

7590 minutes, *Answer.*

3. How many ounces are there in 6 lb. 5 oz. Troy?
 4. In 45 rods 5 yards, how many feet?
 5. In £12 8s. 9½d., how many farthings?
 6. How many inches are there in 40 rods 2 feet?
 7. How many yards are there in 5 miles?

8. How many feet are there in 29 furlongs?
 9. In 6 mi. 6 fur. 36 rods, how many rods?
 10. In 6 yards 6 feet 6 inches, how many inches?
 11. In £4 8s. 9½d., how many farthings?
 12. In 6 gallons 5 quarts 1 pint, how many pints?
 13. Reduce 10 bushels 1 pk. 6 quarts to pints.
 14. Reduce 7 C.ft. 14 cu.ft. to cubic inches.
 15. How many pounds in 3 T. 5 cwt. and 1 qr.?
 16. Change 6 ℥ 3 ⅔ 5 5 2 3 to grains.
 17. How many feet are there in 5 mi. 7 fur. 3 rd.?
 18. How many feet are there in 69 chains?
 19. How many minutes are there in 6 s. 17° 27' ?
 20. In 67 cords of wood, how many cubic feet?
 21. In 57 reams of paper, how many sheets?
 22. How many single things are there in 55 score?
 23. How many single things are there in 44 great gross?
 24. How many sheets of paper in 12 reams 6 quires?
 25. How many seconds are there in 27° 30' ?
 26. Change 40 sq. rd. 15 sq. yd. 8 sq. ft. to square inches.
 27. How many hours are there in the Winter months?
 28. How many minutes in the Summer months?
 29. How many pints are there in 7 bbl. 14 gal. 3 qt.?
 30. Change 6 T. 5 cwt. 3 qr. 4 lb. to pounds.
 31. Change 8 ℥ 9 ⅔ 5 5 3 3 3 5 gr. to grains.
 32. How many seconds are there in 45° 39' 27" ?
 33. In 1 common year, 320 da. 6 hr. 5 min., how many minutes?
 34. In 5 leap years, 27 da. 6 hr. 5 min., how many minutes?
 35. In 5 A. 3 R. 5 P., how many square yards?
 36. In 4 leap years and one common year, how many minutes?