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183 Euston Road
London NW1 2BE UK
T +44 (0)20 7611 8722
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Name Peggy Thurlow

"READER—PERSEVERE."

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Help to Scholars

(NEW AND ENLARGED EDITION)

CONTAINING

MAP OF THE WORLD,

ESSENTIAL DATES OF BRITISH HISTORY,

ARITHMETICAL TABLES AND SIGNS,

GEOGRAPHICAL AND GEOMETRICAL DEFINITIONS,

FOREIGN WORDS AND PHRASES,

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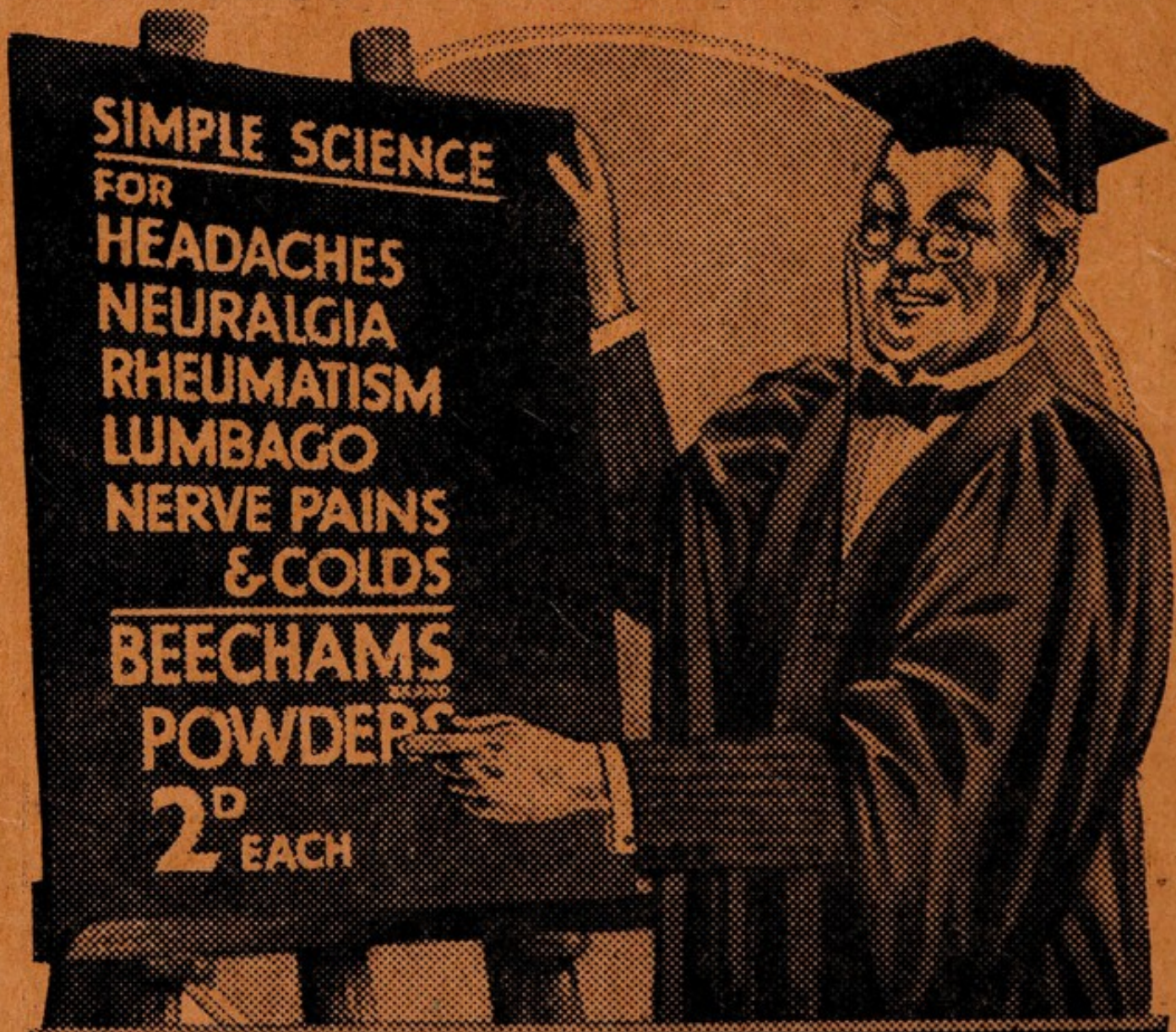

The right answer every time

BEECHAMS BRAND POWDERS

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ARITHMETICAL TERMS, SIGNS, &c.

All computations in Arithmetic are performed by one of the processes known as

ADDITION, SUBTRACTION, MULTIPLICATION, AND DIVISION.

The terms used in Multiplication are :—

(*a*) The Multiplier, or number that Multiplies.
(*b*) The Multiplicand, or number to be Multiplied.
(*c*) The Product, or result of the Multiplication.

The terms used in Division are :—

(*a*) The Dividend, or number to be divided.
(*b*) The Divisor, or number by which you divide.
(*c*) The Quotient, or result of the Division.

To find the SUM, add the numbers.
,, ,, ,, DIFFERENCE, subtract.
,, ,, ,, PRODUCT, multiply.
,, ,, ,, QUOTIENT, divide.

+ plus or more	signifies	addition	as $6 + 3 = 9$
— minus or less	,,	subtraction	,, $8 - 5 = 3$
× multiplied by	,,	multiplication	,, $4 \times 2 = 8$
÷ divided by	,,	division	,, $8 \div 4 = 2$
= equal to	,,	equality	,, $3 + 2 = 5$

$\therefore$ signifies therefore. $\because$ signifies because.

: :: : are the signs of proportion.

6 : 14 :: 18 : 42 means, as 6 is to 14 so is 18 to 42.

$\surd$ sign of square root, as $\surd 9 = 3$. $\surd 16 = 4$. $\surd 36 = 6$.

$6^2 = 6 \times 6 = 36$.

$8^2 = 8 \times 8 = 64$.

$\sqrt[3]{}$ sign of cube root, as $\sqrt[3]{27} = 3$. $3^3 = 3 \times 3 \times 3 = 27$.

( ) { } [ ] are brackets ; all quantities between them are treated as one.

D or d signifies Denarii or pence. L or £ signifies Libræ or pounds.
S or s ,, Solidi or shillings. % ,, per cent.

BEECHAMS HELP TO SCHOLARS.

FOR MULTIPLICATION AND DIVISION.

Twice		
1	are	2
2	,,	4
3	,,	6
4	,,	8
5	,,	10
6	,,	12
7	,,	14
8	,,	16
9	,,	18
10	,,	20
11	,,	22
12	,,	24

3 times		
1	are	3
2	,,	6
3	,,	9
4	,,	12
5	,,	15
6	,,	18
7	,,	21
8	,,	24
9	,,	27
10	,,	30
11	,,	33
12	,,	36

4 times		
1	are	4
2	,,	8
3	,,	12
4	,,	16
5	,,	20
6	,,	24
7	,,	28
8	,,	32
9	,,	36
10	,,	40
11	,,	44
12	,,	48

5 times		
1	are	5
2	,,	10
3	,,	15
4	,,	20
5	,,	25
6	,,	30
7	,,	35
8	,,	40
9	,,	45
10	,,	50
11	,,	55
12	,,	60

6 times.		
1	are	6
2	,,	12
3	,,	18
4	,,	24
5	,,	30
6	,,	36
7	,,	42
8	,,	48
9	,,	54
10	,,	60
11	,,	66
12	,,	72

7 times		
1	are	7
2	,,	14
3	,,	21
4	,,	28
5	,,	35
6	,,	42
7	,,	49
8	,,	56
9	,,	63
10	,,	70
11	,,	77
12	,,	84

8 times		
1	are	8
2	,,	16
3	,,	24
4	,,	32
5	,,	40
6	,,	48
7	,,	56
8	,,	64
9	,,	72
10	,,	80
11	,,	88
12	,,	96

9 times		
1	are	9
2	,,	18
3	,,	27
4	,,	36
5	,,	45
6	,,	54
7	,,	63
8	,,	72
9	,,	81
10	,,	90
11	,,	99
12	,,	108

10 times		
1	are	10
2	,,	20
3	,,	30
4	,,	40
5	,,	50
6	,,	60
7	,,	70
8	,,	80
9	,,	90
10	,,	100
11	,,	110
12	,,	120

11 times		
1	are	11
2	,,	22
3	,,	33
4	,,	44
5	,,	55
6	,,	66
7	,,	77
8	,,	88
9	,,	99
10	,,	110
11	,,	121
12	,,	132

12 times		
1	are	12
2	,,	24
3	,,	36
4	,,	48
5	,,	60
6	,,	72
7	,,	84
8	,,	96
9	,,	108
10	,,	120
11	,,	132
12	,,	144

13 times		
1	are	13
2	,,	26
3	,,	39
4	,,	52
5	,,	65
6	,,	78
7	,,	91
8	,,	104
9	,,	117
10	,,	130
11	,,	143
12	,,	156

NOTE.—These tables must also be learned backwards. Say 9 into 81 is 9 as well as 9 times 9 are 81.

BEECHAMS HELP TO SCHOLARS.

Farthings Table.

Far.		d.
4	make	1
5	,,	1¼
6	,,	1½
7	,,	1¾
8	,,	2
9	,,	2¼
10	,,	2½
11	,,	2¾
12	,,	3
13	,,	3¼
14	,,	3½
15	,,	3¾
16	,,	4
17	,,	4¼
18	,,	4½
19	,,	4¾
20	,,	5
21	,,	5¼
22	,,	5½
23	,,	5¾
24	,,	6
25	,,	6¼
26	,,	6½

Far.		d.
27	make	6¾
28	,,	7
29	,,	7¼
30	,,	7½
31	,,	7¾
32	,,	8
33	,,	8¼
34	,,	8½
35	,,	8¾
36	,,	9
37	,,	9¼
38	,,	9½
39	,,	9¾
40	,,	10
41	,,	10¼
42	,,	10½
43	,,	10¾
44	,,	11
45	,,	11¼
46	,,	11½
47	,,	11¾
48	,,	12
960	,,	£1

Pence Table.

d.		s.	d.
12	make	1	0
13	,,	1	1
14	,,	1	2
15	,,	1	3
16	,,	1	4
17	,,	1	5
18	,,	1	6
19	,,	1	7
20	,,	1	8
21	,,	1	9
22	,,	1	10
23	,,	1	11
24	,,	2	0
25	,,	2	1
26	,,	2	2
27	,,	2	3
28	,,	2	4
29	,,	2	5
30	,,	2	6
36	,,	3	0

d.		s.	d.
40	make	3	4
48	,,	4	0
50	,,	4	2
60	,,	5	0
70	,,	5	10
72	,,	6	0
80	,,	6	8
84	,,	7	0
90	,,	7	6
96	,,	8	0
100	,,	8	4
108	,,	9	0
110	,,	9	2
120	,,	10	0
130	,,	10	10
132	,,	11	0
140	,,	11	8
144	,,	12	0
200	,,	16	8
240	,,	£1	

Shillings Table.

s.		£	s.
20	make	1	0
30	,,	1	10
40	,,	2	0
50	,,	2	10
60	,,	3	0
70	,,	3	10
80	,,	4	0
90	,,	4	10
100	,,	5	0
110	,,	5	10
120	,,	6	0
130	,,	6	10
140	,,	7	0

s.		£	s.
150	make	7	10
160	,,	8	0
170	,,	8	10
180	,,	9	0
190	,,	9	10
200	,,	10	0
300	,,	15	0
400	,,	20	0
500	,,	25	0
600	,,	30	0
800	,,	40	0
1000	,,	50	0
2000	,,	100	0

Table of Factors.

12	=	2	×	6	48	=	4	× 12
12	=	3	,,	4	48	=	6	,, 8
14	=	2	,,	7	49	=	7	,, 7
15	=	3	,,	5	50	=	5	,, 10
16	=	2	,,	8	54	=	6	,, 9
16	=	4	,,	4	55	=	5	,, 11
18	=	2	,,	9	56	=	7	,, 8
18	=	3	,,	6	60	=	5	,, 12
20	=	2	,,	10	60	=	6	,, 10
20	=	4	,,	5	63	=	7	,, 9
21	=	3	,,	7	64	=	8	,, 8
22	=	2	,,	11	66	=	6	,, 11
24	=	2	,,	12	70	=	7	,, 10
24	=	3	,,	8	72	=	6	,, 12
24	=	4	,,	6	72	=	8	,, 9
25	=	5	,,	5	77	=	7	,, 11
27	=	3	,,	9	80	=	8	,, 10
28	=	4	,,	7	81	=	9	,, 9
30	=	3	,,	10	84	=	7	,, 12
30	=	5	,,	6	88	=	8	,, 11
32	=	4	,,	8	90	=	9	,, 10
33	=	3	,,	11	96	=	8	,, 12
35	=	5	,,	7	99	=	9	,, 11
36	=	3	,,	12	100	=	10	,, 10
36	=	4	,,	9	108	=	9	,, 12
36	=	6	,,	6	110	=	10	,, 11
40	=	4	,,	10	120	=	10	,, 12
40	=	5	,,	8	121	=	11	,, 11
42	=	6	,,	7	132	=	11	,, 12
44	=	4	,,	11	144	=	12	,, 12
45	=	5	,,	9	144	÷	12	= 12

THE ROMAN NOTATION TABLE.

1	I.	11	XI.	25	XXV.	300	CCC.
2	II.	12	XII.	30	XXX.	400	CD.
3	III.	13	XIII.	40	XL.	500	D.
4	IV.	14	XIV.	50	L.	600	DC.
5	V.	15	XV.	60	LX.	700	DCC.
6	VI.	16	XVI.	70	LXX.	800	DCCC.
7	VII.	17	XVII.	80	LXXX.	900	CM.
8	VIII.	18	XVIII.	90	XC.	1000	M.
9	IX.	19	XIX.	100	C.	1500	MD.
10	X.	20	XX.	200	CC.	2000	MM.

A line placed over any letter increases the value 1,000 times, as—

$\bar{V}$ — 5,000 ;
$\bar{D}$ — 500,000 ;
$\bar{M}$ — 1,000,000.

TIME MEASURE.

60 Seconds	1 Minute.	4 Weeks	1 Lunar month.
60 Minutes	1 Hour.	13 Lunar months and 1 day	1 Year.
24 Hours	1 Day.	52 Weeks and 1 day	1 Year.
7 Days	1 Week.	28, 29, 30 or 31 days	1 Calendar month.
365 Days	1 Year.	12 Calendar months	1 Year.
366 Days	1 Leap Year.	10 Years	1 Decade.
100 Years	1 Century.		

Avoirdupois Weight.

16 Drams ...437½ grains	1 *oz.*
16 Ounces...7,000 ,,	1 *lb.*
14 Lbs.	1 *Stone.*
28 Pounds *or* 2 Stones	1 *qr. of cwt.*
4 Quarters *or* 8 Stones *or* 112 lbs.	1 *cwt.*
20 Hundred-weights *or* 2,240 lbs.	1 *ton.*

Long Measure.

12 Inches (*in.*)	1 *ft.*
3 Feet *or* 36 inches	1 *yd.*
5½ Yards...	1 *Rod, perch or pole.*
22 Yards *or* 4 poles	1 *Chain.*
40 Poles *or* 10 Chs., *or* 220 yds....	1 *fur.*
8 Furlongs *or* 80 chs.*or* 1,760 yds.	1 *ml.*
3 Miles	1 league *lea.*
7·92 Inches	1 *link.*
100 Links ... 22 yards	1 *chain.*

7 Yards	1 *Irish perch.*
2,240 Yards	1 *Irish mile.*

Square Measure.

144 Sq. Inches...12×12... 1 *sq. ft.*
9 Sq. Feet ... 3× 3... 1 *sq. yd.*
30¼ Sq. Yds. ...5½×5½... 1 *sq. pl.*
40 Poles *or* 1,210 sq. yds. ... 1 *rood.*
4 Roods *or* 4,840 sq. yds. ... 1 *acre.*
640 Acres *or* 6,400 sq. chs. 1 *square mile.*
10,000 Sq. Links...484 sq. yds. 1 *square chain.*
10 Sq. Chains, 100,000 sq. lks. 1 *Acre.*

---

49 Sq. Yards ... 1 *sq. perch, Irish.*
7,840 Sq. Yards ... 1 *Irish acre.*

Cubic Measure.

1,728 C. Inches...12×12×12... 1 *cu. ft.*
27 C. Feet ... 3× 3×3... 1 *cu. yd.*

Measure of Capacity.

For Liquids, Fruits, and Grains.

4 Gills ... ... 1 Pint *pt.*
2 Pints ... ... 1 Quart *qt.*
4 Quarts, *or* 8 pts. ... 1 Gallon *gal.*
2 Gallons ... ... 1 Peck *pk.*
4 Pecks, *or* 8 gals. ... 1 Bushel *bush.*
8 Bushels ... ... 1 Quarter *qr.*

Old Troy Weight.

Used in weighing gold, silver, jewels, &c.

24 Grains (*gr.*) ...1 Pennyweight *dwt.*
20 Pennyweights 480 grains... 1 *oz.*
12 Ounces ... 5,760 grains... 1 *lb.*

Miscellaneous.

2 Articles...make 1 Brace or Couple.
12 Articles... ,, ... 1 Dozen.
12 Dozen ... ,, ... 1 Gross.
20 Articles... ,, ... 1 Score.
24 Sheets of Paper make 1 Quire.
120 Sheets ... ,, ... 5 Quires.
20 Quires ... ,, ... 1 Ream.
1 Gallon = ·1604 cu.ft. = 277·27 cu. in.
1 Gal. of Water at 62°F weighs 10 lbs.
1 Cu.ft. of water = 62·3 lbs. or 6·23 gals.
1 Knot or Geographical mile = 6,080 ft.
1 Rod Brickwork = 306¼ cu. ft. = 11⅓ cu. yd.
1 Ton Granite = 13½ cu. ft.
1 Square of Slates = 100 sq. ft.
1 Cu. ft. of Oak = 40 to 60 lbs.
Breaking wt. of beam = $c \times b \times d^2 \div L$.
1 Cu. yd. of earth = 1 load.
40 Cu. ft. rough timber = 1 ton or load.

Angular Measure.

60 seconds (″) ... make 1 minute′.
60 minutes (′) ... ,, 1 degree°.
90 degrees (a right angle) ,, 1 quadrant.
180 ,, (two right angles) ,, 1 semicircle.
360 ,, or twelve signs ,, 1 circle.
57·3° = 1 radian.

Apparent Motion of the Sun.

The Sun moves 360° in 24 hours, 15° in 1 hour, 1° in 4 mins.; and ¼° in 1 min.

60 Geographical, *or* 69⅓ English Miles 1 degree (1°) of Latitude, but degrees of Longitude vary in length according to the Latitude, because all the meridian circles meet at the poles. In Latitude 50° a degree measures 44·35 English miles. In Latitude 60° a degree measures 34·5 English miles.

PRACTICE TABLES.

Parts of a Sovereign.

s.	d.		
13	4	..	$\frac{2}{3}$
10	0	..	$\frac{1}{2}$
6	8	..	$\frac{1}{3}$
5	0	..	$\frac{1}{4}$
4	0	..	$\frac{1}{5}$
3	4	..	$\frac{1}{6}$
2	6	..	$\frac{1}{8}$
2	0	..	$\frac{1}{10}$
1	8	..	$\frac{1}{12}$
1	4	..	$\frac{1}{15}$
1	3	..	$\frac{1}{16}$
1	0	..	$\frac{1}{20}$
0	8	..	$\frac{1}{30}$
0	$7\frac{1}{2}$	..	$\frac{1}{32}$
0	6	..	$\frac{1}{40}$
0	4	..	$\frac{1}{60}$
0	3	..	$\frac{1}{80}$
0	2	..	$\frac{1}{120}$
0	$1\frac{1}{2}$	..	$\frac{1}{160}$
0	1	..	$\frac{1}{240}$

Parts of a Shilling.

d.		
9	..	$\frac{3}{4}$
8	..	$\frac{2}{3}$
6	..	$\frac{1}{2}$
4	..	$\frac{1}{3}$
3	..	$\frac{1}{4}$
2	..	$\frac{1}{6}$
$1\frac{1}{2}$	..	$\frac{1}{8}$
1	..	$\frac{1}{12}$
$\frac{1}{2}$	..	$\frac{1}{24}$
$\frac{1}{4}$	..	$\frac{1}{48}$

Parts of a Quarter Cwt.

lbs.		
14	..	$\frac{1}{2}$
7	..	$\frac{1}{4}$
4	..	$\frac{1}{7}$
$3\frac{1}{2}$	..	$\frac{1}{8}$
2	..	$\frac{1}{14}$
$1\frac{3}{4}$	..	$\frac{1}{16}$
1	..	$\frac{1}{28}$

Parts of a Ton.

cwts.	qrs.		
10	0	..	$\frac{1}{2}$
5	0	..	$\frac{1}{4}$
4	0	..	$\frac{1}{5}$
2	2	..	$\frac{1}{8}$
2	0	..	$\frac{1}{10}$
1	1	..	$\frac{1}{16}$
1	0	..	$\frac{1}{20}$
0	2	..	$\frac{1}{40}$
0	1	..	$\frac{1}{80}$

Parts of a Cwt.

qrs.	lbs.		
2	0	..	$\frac{1}{2}$
1	0	..	$\frac{1}{4}$
0	16	..	$\frac{1}{7}$
0	14	..	$\frac{1}{8}$
0	8	..	$\frac{1}{14}$
0	7	..	$\frac{1}{16}$
0	4	..	$\frac{1}{28}$
0	2	..	$\frac{1}{56}$
0	1	..	$\frac{1}{112}$

Parts of an Acre.

80	poles	or	2	roods	$\frac{1}{2}$
40	,,	,,	1	,,	$\frac{1}{4}$
32	,,	,,	968	yds.	$\frac{1}{5}$
20	,,	,,	605	,,	$\frac{1}{8}$
16	,,	,,	484	,,	$\frac{1}{10}$
—	,,	,,	440	,,	$\frac{1}{11}$
10	,,	,,	—	,,	$\frac{1}{16}$
8	,,	,,	242	,,	$\frac{1}{20}$

Parts of a Mile.

4	fur.	(880 yds.)	$\frac{1}{2}$
2	,,	(440 ,,)	$\frac{1}{4}$
1	,,	(220 ,,)	$\frac{1}{8}$
32	poles	(176 ,,)	$\frac{1}{10}$
20	,,	(110 ,,)	$\frac{1}{16}$
16	,,	(88 ,,)	$\frac{1}{20}$
8	,,	(44 ,,)	$\frac{1}{40}$
4	,,	(22 ,,)	$\frac{1}{80}$
2	,,	(11 ,,)	$\frac{1}{160}$
1	,,	($5\frac{1}{2}$,,)	$\frac{1}{320}$

Involution.

Square of			Cube of		
13	is	169	1	is	1
14	,,	196	2	,,	8
15	,,	225	3	,,	27
16	,,	256	4	,,	64
17	,,	289	5	,,	125
18	,,	324	6	,,	216
19	,,	361	7	,,	343
20	,,	400	8	,,	512
30	,,	900	9	,,	729
40	,,	1,600	10	,,	1,000
50	,,	2,500	11	,,	1,331

Reverse these for Square and Cube Roots.

Vulgar and Decimal Fractions.

$\frac{1}{2}$	=	·5	$\frac{1}{5}$	=	·2	$\frac{1}{3}$	=	$\dot{3}$
$\frac{1}{4}$	,,	·25						
$\frac{3}{4}$	,,	·75	$\frac{2}{5}$	,,	·4	$\frac{2}{3}$	,,	$\dot{6}$
$\frac{1}{8}$	,,	·125				$\frac{1}{9}$	,,	$\dot{1}$
$\frac{3}{8}$	,,	·375	$\frac{3}{5}$	,,	·6	$\frac{2}{9}$	,,	$\dot{2}$
$\frac{5}{8}$	,,	·625						
$\frac{7}{8}$	,,	·875	$\frac{4}{5}$	,,	·8	$\frac{1}{6}$	,,	$\dot{1}6$

Decimals of £1.

£·1 = 2/-; £·05 = 1/-;
£·025 = 6d.; £·0125 = 3d.;
£·00625 = 1½d.; £·001 = ¼d. approx.

Interest and Discount.

		s.	d.			
$1\frac{1}{4}$%	is	0	3	in the £	=	$\frac{1}{80}$
$1\frac{1}{2}$	,,	0	$3\frac{3}{5}$	,, £		
2	,,	0	$4\frac{4}{5}$	,, £	=	$\frac{1}{50}$
$2\frac{1}{2}$	,,	0	6	,, £	=	$\frac{1}{40}$
3	,,	0	$7\frac{1}{5}$	,, £		
$3\frac{1}{2}$	,,	0	$8\frac{2}{5}$	,, £		
4	,,	0	$9\frac{3}{5}$	,, £	=	$\frac{1}{25}$
$4\frac{1}{2}$	,,	0	$10\frac{4}{5}$	,, £		
$4\frac{1}{6}$	,,	0	10	,, £	=	$\frac{1}{24}$
5	,,	1	0	,, £	=	$\frac{1}{20}$
6	,,	1	$2\frac{2}{5}$	,, £		
$6\frac{1}{4}$	,,	1	3	,, £	=	$\frac{1}{16}$
$6\frac{2}{3}$	,,	1	4	,, £	=	$\frac{1}{15}$
$7\frac{1}{2}$	,,	1	6	,, £		
$8\frac{1}{3}$	,,	1	8	,, £	=	$\frac{1}{12}$
10	,,	2	0	,, £	=	$\frac{1}{10}$
$12\frac{1}{2}$	,,	2	6	,, £	=	$\frac{1}{8}$
15	,,	3	0	,, £		
$16\frac{2}{3}$	,,	3	4	,, £	=	$\frac{1}{6}$
$17\frac{1}{2}$	,,	3	6	,, £		
20	,,	4	0	,, £	=	$\frac{1}{5}$
$22\frac{1}{2}$	,,	4	6	,, £		
25	,,	5	0	,, £	=	$\frac{1}{4}$
$33\frac{1}{3}$	,,	6	8	,, £	=	$\frac{1}{3}$
50	,,	10	0	,, £	=	$\frac{1}{2}$
75	,,	15	0	,, £	=	$\frac{3}{4}$

Algebraic Factors.

$(a+b)^2 = a^2+b^2+2ab$
$(a-b)^2 = a^2+b^2-2ab$
$(a+b)(a-b) = a^2-b^2$
$(a+b+c)^2 = a^2+b^2+c^2+2ab+2ac+2bc$
$(a-b+c)^2 = a^2+b^2+c^2-2ab+2ac-2bc$
$(a+b-c)^2 = a^2+b^2+c^2+2ab-2ac-2bc$
$(a+b+c+d)^2 = a^2+b^2+c^2+d^2+2ab+2ac+2ad+2bc+2bd+2cd$
$(a+b)^3 = a^3+3a^2b+3ab^2+b^3$
$(a-b)^3 = a^3-3a^2b+3ab^2-b^3$
$(a+b)^4 = a^4+4a^3b+6a^2b^2+4ab^3+b^4$
$(a-b)^4 = a^4-4a^3b+6a^2b^2-4ab^3+b^4$
$a^6+b^6 = (a^2+b^2)(a^4-a^2b^2+b^4)$
$a^3+b^3 = (a+b)(a^2-ab+b^2)$
$a^3-b^3 = (a-b)(a^2+ab+b^2)$
$a^4-b^4 = (a^2-b^2)(a^2+b^2)$
$a^4+a^2b^2+b^4 = (a^2+ab+b^2)(a^2-ab+b^2)$
$a^6-b^6 = (a^3-b^3)(a^3+b^3)$ or $(a^2-b^2)(a^4+a^2b^2+b^4)$

When n is even x^n-y^n is exactly divisible by $(x+y)$ or $(x-y)$ but x^n+y^n is not.
When n is odd x^n-y^n is exactly divisible by $(x-y)$ and x^n+y^n by $x+y$.

TABLES OF THE "METRIC SYSTEM."

Length.

Myriametre	=	10,000 metres.
Kilometre	=	1,000 ,,
Hectometre	=	100 ,,
Decametre	=	10 ,,

METRE = The 10 millionth part of a quarter of a meridian circle.

Decimetre	=	·1 metres.
Centimetre	=	·01 ,,
Millimetre	=	·001 ,,

A Metre = 39·37 *inches.*

25·4 *mm.* = 1 *inch.*

Surface Measure

for Walls, Floors, Paper, Glass, &c.

The *SQUARE METRE* contains—

100 Square Decimetres.
10,000 ,, Centimetres.
1,000,000 ,, Millimetres.

Surface Measure

for Fields, Woods, &c.

Hectare = 100 ares.
ARE = 100 Square Metres.
Centiare = ·01 of an are = 1 sq. M.

An Are = 119·6033 Square Yards.

Volume Measure

for Wine, Oil, Wheat, Apples, &c.

The Kilolitre	=	1,000 litres.
,, Hectolitre	=	100 ,,
,, Decalitre	=	10 ,,
LITRE	=	1 Cubic Decimetre.
The Decilitre	=	·1 litres.
,, Centilitre	=	·01 ,,
,, Millilitre	=	·001 ,,

A Litre of distilled water weighs 1 Kilogramme, and equals 1·76077 *pints.*

Measure of Solidity

for Masonry, Capacity of Docks, &c.

The Unit is the CUBIC METRE which contains—

1,000 cubic Decimetres.
1,000,000 ,, Centimetres.
1,000,000,000 ,, Millimetres.

Measure of Solidity

for Firewood, Ropes, Dyewoods, &c.

The Decastere = 10 steres.
STERE = 1 Cubic Metre.
The Decistere = ·1 steres.

The Stere = 1 *cub. yd.* 8·31655 *cub. ft.*

Weight.

The Millier or Tonne	=	1,000 kilogrammes
,, Metric Quintal	=	100 ,,
,, Myriagramme	=	10 ,,
,, Kilogramme	=	1,000 grammes.
,, Hectogramme	=	100 ,,
,, Decagramme	=	10 ,,

GRAMME = a Cubic Centimetre of distilled water at 39½° F. weighed in a vacuum.

The Decigramme	=	·1 grammes
,, Centigramme	=	·01 ,,
,, Milligramme	=	·001 ,,

A Gramme = ·56438 *drams Kg.* = 2·204 *lbs.*
453·6 *grammes* = 1 *lb.*

A Millier is weight of 1 *cu. Metre of Water.*

A Kilogramme is weight of 1 *cu. dm. of Water.*

The French MONETARY Unit is the FRANC.

The Franc	=	10 Decimes.
,, ,,	=	100 Centimes.

20 *one-franc pieces and* 20 *two-franc pieces placed in line measure a metre.*

Suggested English Coinage.

10 mils	=	1 cent.
10 cents	=	1 florin.
10 florins	=	1 sovereign.

£1 = 10 florins = 100 cents = 1,000 mils.

MENTAL ARITHMETIC AIDS.

A Number will divide by :—

2 when the last figure is even or a cypher.

3 when the sum of the digits can be divided by 3.

4 when the last two figures can be divided by 4 or are cyphers.

5 when the last figure is 5 or 0.

6 when the last figure is even or 0 and the sum of the digits will divide by 3.

7 when the number is composed of 6 figures all alike, e.g., 333,333 ; when composed of 6 figures of which the first three are like the last three, e.g., 421,421.

8 when the last 3 figures can be divided by 8 or are cyphers.

9 when the sum of the digits can be divided by 9.

25 when last 2 figures are 0's or will divide by 25.

125 when last 3 figures are 0's or will divide by 125.

37 and 111 when the No. is composed of the same 3 digits, e.g., 333,111.

To multiply by

5 add 1 cypher and divide by 2.
25 „ 2 cyphers „ „ 4.
125 „ 3 „ „ „ 8.
625 „ 4 „ „ „ 16.
10 „ 1 cypher.
100 „ 2 cyphers.
1,000 „ 3 „

To divide by

5 multiply by 2 and place a · before last figure.
25 „ „ 4 „ „ „ „ 2 figures.
125 „ „ 8 „ „ „ „ 3 „
10 cut off last figure for a remainder.
100 „ „ 2 figures for a remainder.
1,000 „ „ 3 „ „

To multiply a number consisting of two digits by 11, add the figures together and place the result between them, as 71 × 11 = 781, unless the *result* exceeds 9, when it is dealt with as indicated in the example :

75 × 11 = 7 5
12
825

MENTAL ARITHMETIC AIDS—continued.

To find a year's income (Sundays included) at a given rate per day :—Take a sovereign, a half-sovereign, and five pence as many times as there are pennies in the given rate :—Example, 365 days at 17/5 per day. 17/5 = 209 pence (209 × £1 = £209) + (209 × 10/- = £104/10/-) + (209 × 5d. = 1045d. = £4/7/1) £209 + £104/10/- + £4/7/1 = £317/17/1 total.

To find the cost of any number of articles when the price is an aliquot part of a sovereign :—Take the number as sovereigns and divide by the aliquot part.

2,786 at 3/4 each : 2,786 divided by 6 = £464. 6s. 8d.

1. To find the cost of a dozen :—Express cost of 1 in pence and fractions of a penny, and the answer is that number of shillings.

2. To find the cost of a score :—Express cost of 1 in shillings and fractions of a shilling, and the answer is that number of pounds.

Simple Interest Formulæ.—Interest = P × R × T ÷ 100. Principal = I × 100 ÷ R and T. Rate = I × 100 ÷ P and T. Time = Interest × 100 ÷ P and R.

Mensuration Formulæ.—1.—Area of square, rectangle, rhombus or rhomboid = base × height. Base = area ÷ height. Height = area ÷ base. 2.—Area of Triangle = $\frac{1}{2}$ base × height. 3.—Area of Circle = $d^2 \times \cdot 7854$, or = $r^2 \times \pi$. 4.—Circumference = diameter × π. 5.—Cubical content of a box or volume of a solid = length × breadth × height. Length = volume ÷ breadth and height. Breadth = volume ÷ length and height. Height = volume ÷ length and breadth. 6.—Vol. of Cylinder or Prism = base area × height. 7.—Vol. of Cone or Pyramid = $\frac{1}{3}$ base area × height. 8.—Vol. of Sphere = $\frac{4}{3}r^3 \times \pi$. 9.—Surface of Sphere = $4r^2 \times \pi$ or $d^2 \times \pi$. 10.—Area of Square = diagonal^2 ÷ 2. 11.—Side of Square = $\frac{1}{2}$ diagonal × $\sqrt{2}$. 12.—Diagonal of Square = side × $\sqrt{2}$. 13.—Area of any quadrilateral = diagonal × half sum of perpendiculars from opposite angles. 14.—Vol. of Log = Length × ($\frac{1}{4}$ girth)^2.

Note.—π=3·1416 or $3\frac{1}{7}$. Note—$\sqrt{2}$ = 1·41421.

RAPID DECIMALISATION OF MONEY.

To decimalise 18s. 4½d. proceed as follows:—(*a*) Bring the pence and halfpence (or farthings, if there are any) to farthings. 4½ × 4 = 18. Put down 8 and carry 1. (*b*) Multiply the shillings by 5 and add the number to be carried. 18 × 5 = 90 and 1 carried = 91. The answer is 0·918.

Let us work another example and remember that if the number of pence in the question is 6 or more we must add another 1 to the farthings total. EXAMPLE: Decimalise 15s. 8¾d. 8¾ × 4 = 35. Now add 1 because the amount being dealt with is 6d. or over. 35 + 1 = 36. Put down 6 and carry 3. 15 × 5 = 75 and 3 carried gives 78. The answer is 0·786.

The reverse operation is quite simple.

Change ·786 to shillings, pence, etc. (*a*) Divide the first two decimal figures by 5, which gives 15 and 3 over. Call the 15, shillings and treat the 36 as farthings (remembering to deduct 1 if the number is over 24, the number of farthings in sixpence). 36 — 1 = 35 farthings = 8¾d. Answer, 15s. 8¾d.

Remember that ¼ = ·25, ½ = ·5, and ¾ = ·75. As it is generally necessary to go to 5 decimal places in order to obtain correct results we will now extend the examples given previously.

EXAMPLE A. 18s. 4½d. = ·918, 4½ = 4·5. Divide this by 6, which gives 75 and place these figures after the answer given above, thus: 18s. 4½d. = ·91875.

EXAMPLE B. 15s. 8¾d. = ·786. In this case we have already added an extra 1 since the pence column is over 6d., so take 6d. off the amount, 8¾ — 6 = 2¾ = 2·75. Dividing by 6 as before gives 458. Hence 15s. 8¾d. = ·786458. (Five decimal places are generally sufficient.)

Application of the Method.

To find the cost of 1,000 articles at £1 17s. 7¼d. each: £1 17s. 7¼d. = £1·880208. £1·880208 × 1000 = £1880·208 = £1880 4s. 2d. answer.

GEOGRAPHICAL DEFINITIONS.

Geography teaches about the surface of the earth. This surface is composed of *Land* and *Water*. If we were to divide it into four parts, three would be water, and one land.

The *Earth* is a planet or moving star. In shape it is like an orange. It moves in two ways; 1st, rotates on its own axis, in 24 hours, causing Day and Night; 2nd, revolves round the Sun, in 365¼ days, causing the Four Seasons, Spring, Summer, Autumn, Winter.

A map of a *Hemisphere* is a plan of half the earth. It may be *Northern*, lying North of the Equator; *Southern*, lying South; *Eastern*, containing Europe, Asia, Africa and Australia; *Western*, containing North and South America.

The *Axis* is an imaginary line on which the earth rotates. Its ends are called the *N.* and *S. Poles*. The diameter, or distance through the earth, is 8,000 miles. The circumference, or the distance round the outside, is 25,000 miles. The *Equator* is an imaginary line passing round the earth, midway between the Poles.

Latitude is distance North or South of the Equator, measured in degrees up to 90°, each = 69½ English miles. A *Meridian* is a line passing halfway round the Earth from the N. Pole to the S. Pole. The line passing through Greenwich is called our *First Meridian*, and is marked 0° on English maps. *Longitude* is distance East or West of the First Meridian. In Great Britain the length of a degree of longitude varies from 34 miles in the N., to 45 miles in the S. A *Zone* is a belt or girdle passing round the earth. There are 5; one Torrid, very hot, round about the Equator; two Frigid, very cold, one surrounding each pole; and two Temperate, between the Torrid and Frigid zones.

A *Continent* is the largest division of land. There are 5; Asia, America, Africa, Europe, Australia.

A *Country* is part of a continent, having a particular name. England, Scotland, Ireland, Wales, France, Spain, Germany.

A *County* or *Shire* is part of a country; sometimes called a *Province*, or Department, Canton, State, &c.

A *Riding* (Trything) is a third part of a county. Yorkshire is so divided.

GEOGRAPHICAL DEFINITIONS—continued.

An *Island* is a piece of land surrounded by water.

A *Peninsula* is a piece of land nearly surrounded by water.

An *Isthmus* is a narrow neck of land joining two large divisions.

A *Cape* is a point of land stretching into the sea. Other names are *Head, Ness, Naze, Mull, Butt, Promontory, Foreland, Point, Bill.*

A *Coast* or *Shore* is the land washed by the sea. A *Beach* is the portion of shore which is alternately covered and uncovered by the tide.

A *Hill* is a high mass of land, less than 1,000 feet above sea-level.

A *Mountain* is a high mass of land more than 1,000 feet above sea-level; an isolated mountain is a *Peak*; several peaks form a *Group*; connected mountains form a *Chain* or *Range*; a *Volcano* is an opening in the surface of the earth from which lava, ashes, dust and steam pour out; a hill is often formed of some of these materials, and the opening or mouth is called the *Crater.*

A *Plain* is a level portion of land, at no great height above the level of the sea. The plains in South Russia and Central Asia are termed *Steppes*, and are generally uncultivated. In North America, they are called *Prairies* and *Savannahs*; and in South America, *Llanos, Pampas*, and *Selvas.*

A *Table Land* or *Plateau* is a level portion of land at a considerable elevation.

A *Valley* is low land, bounded on each side by hills. Other names are *Vale, Canyon, Dale, Glen, Gorge, Strath.* A *Ravine* is a long hollow between hills.

A *Desert* is a barren tract of land. A *Cliff* is the vertical face of a mountain or rocky sea-shore.

An *Oasis* is a green spot in a desert, containing trees and a spring of water.

An *Ocean* is the largest division of salt water. There are 5; Pacific, Atlantic, Indian, Antarctic, Arctic. A *Sea* is part of an ocean; if studded with islands, it is called an *Archipelago.* A *Gulf* or *Bay* is a portion of water extending into the land. An *Estuary* is the wide mouth of a river, which is only filled with water when the tide flows in, and exhibits a long

GEOGRAPHICAL DEFINITIONS—continued.

stretch of sand or mud when the tide ebbs. Other names are *Aber* and *Firth.* A *Harbour* or *Haven* is an inlet of the sea, where ships can shelter. A *Creek* or *Cove* is a small inlet of the sea. In Australia and America a river is often called a *Creek.* A place where ships can anchor near a coast is called a *Roadstead* or *Road.* A *Strait* is a narrow neck of water joining two large portions. A *Channel* is similar to a strait, but longer and wider.

A *Lake* is a portion of water surrounded by land; small lakes are termed *Pools* or *Meres;* if in high land or among mountains, *Tarns;* if shallow and filled with sea water, *Lagoons.* In Ireland, lakes are called *Loughs;* in Scotland, *Lochs.* A *Lagoon* is also the name given to the calm water inside a ring-shaped coral island.

A *Spring* is water flowing out of the earth, and generally forms the beginning of a river. *Geysers* are natural fountains of hot water.

A *River* is a running stream of fresh water, issuing from a hill, or other high land, and generally flowing into the sea. The beginning is its *Source;* the ending, its *Mouth;* the sides, its *Banks;* little streams running into it, its *Feeders, Tributaries,* or *Affluents;* where the river lies, its *Bed.* The land drained by one river and its tributaries is its *Basin.*

The high land dividing two basins is the *Water-parting;* and the slopes down which the streams run, form the *Watershed.* A *Rivulet, Brook,* or *Streamlet,* is a little river. A *Confluence* is a place where two rivers unite. The right and left *Banks* of a river take their names from the *Course,* or direction in which the water runs. An artificial river is called a *Canal.*

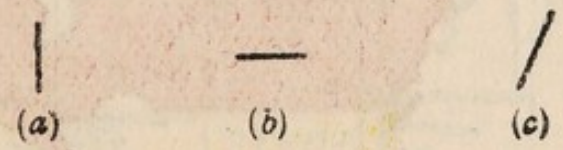
A *Waterfall* is a place where the water of a river falls from a higher to a lower level. A *Cataract* is a large waterfall. A *Rapid* is a place where the bed of a river slopes, causing the river to run swiftly. A *Cascade* is formed when the river runs down a steep, rocky bed. A *Glacier* is a tremendous mass of ice filling a valley, and moving slowly downwards. An *Iceberg* is a floating mountain of ice broken off the end of a Glacier by waves. An *Avalanche* is a mass of snow, ice, stones, etc., slipping down a mountain side.

GEOMETRY DEFINITIONS.

A *Point* has position, but not size.

A *Line* has length, but not breadth.

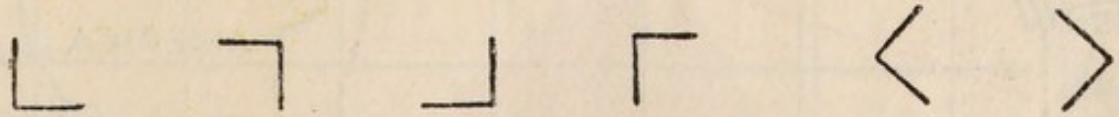
A Straight (or right) Line is the shortest distance between two points and is shorter than a curved line.



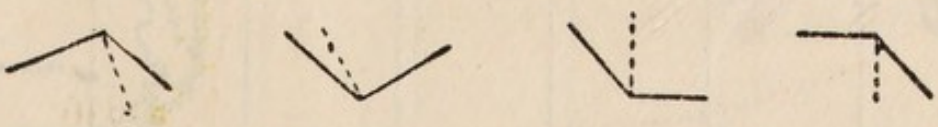
(*a*) A Vertical Line is upright.
(*b*) A Horizontal Line is level.
(*c*) An Oblique Line is sloping.

Parallel Lines are the same distance apart everywhere.

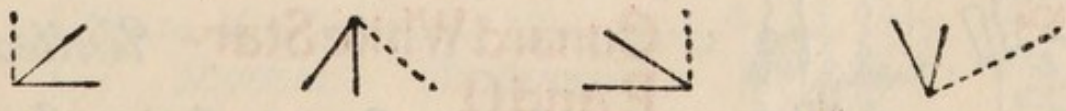
Angle.—Two straight lines drawn from the same point are said to contain an angle.



A Right Angle is a square corner. The lines which contain it are said to be perpendicular to each other.



An Obtuse Angle (blunt) is greater than a right angle.

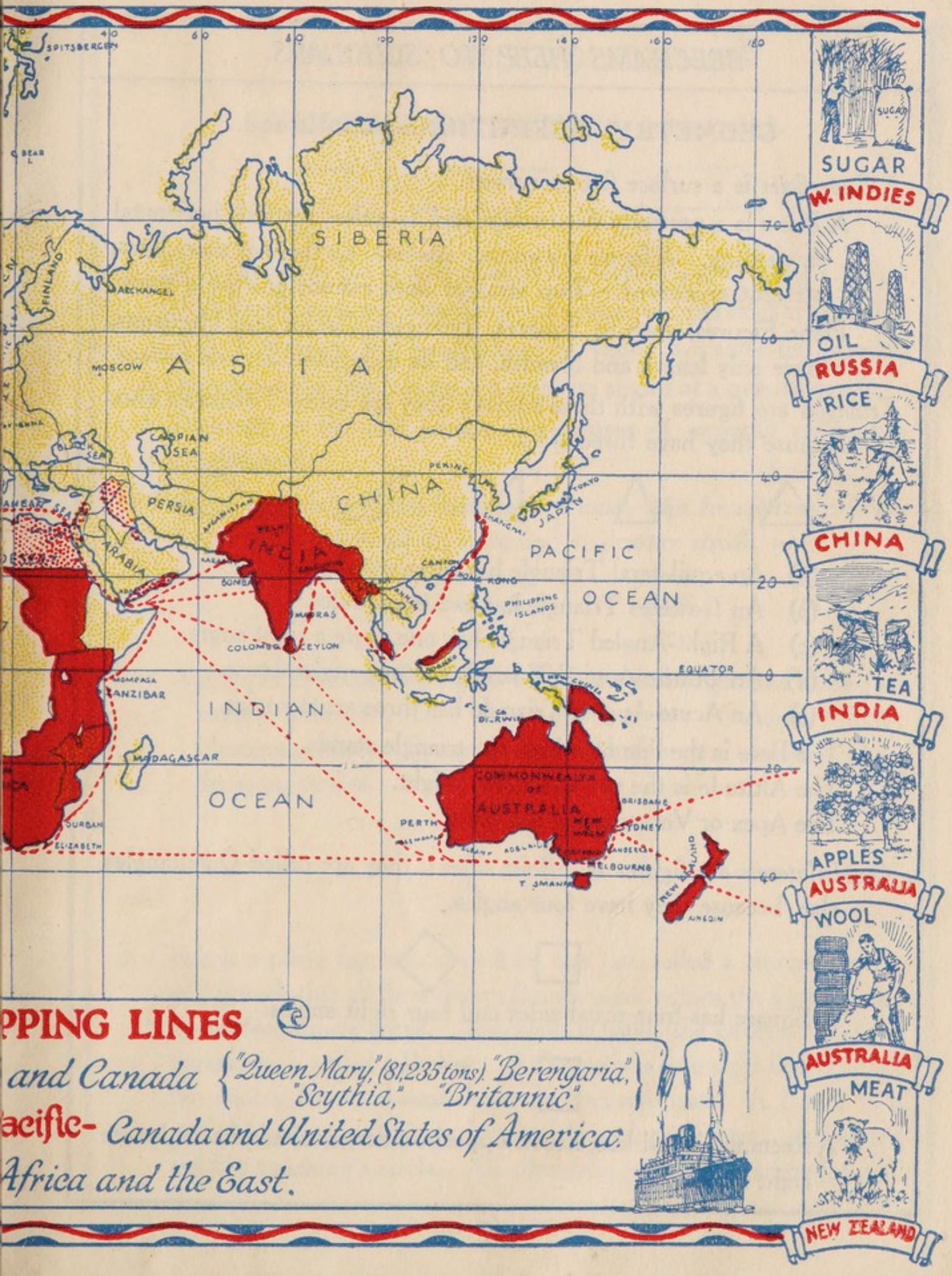


An Acute Angle (sharp) is less than a right angle.
A Reflex Angle is greater than 180°.

PRINCIPAL

Cunard White Star- *United States of Am*
P. and O. & Orient- *Egypt, India, Australia.* **Cana**
Union Castle Lin

British Empire in Red.



PPING LINES

and Canada { "Queen Mary," (81,235 tons). "Berengaria," "Scythia," "Britannic." }

acific- Canada and United States of America.

Africa and the East.

GEOMETRY DEFINITIONS—continued.

A *Superficies* is a surface flat or curved.

A Plane is a perfectly flat surface and is either vertical, horizontal or slanting. A figure is a surface enclosed by three or more lines, straight or curved. Two straight lines cannot enclose a space.

Plane Figures, such as Squares, Triangles, Circles and Hexagons, have only length and breadth, and lie completely on one surface.

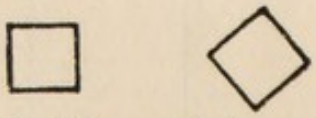
Triangles are figures with three angles: they are called Trilaterals also, because they have three sides.

(*a*) (*b*) (*c*) (*d*) (*e*)

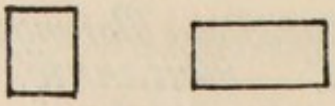
(*a*) An equilateral Triangle has three equal sides.
(*b*) An Isosceles Triangle has two equal sides.
(*c*) A Right-Angled Triangle has one angle a right angle.
(*d*) An Obtuse-Angled Triangle has one angle obtuse.
(*e*) An Acute-Angled Triangle has three acute angles.

The Base is the line on which the triangle stands.
The Altitude is the perpendicular height.
The Apex or Vertex is the top point.

Quadrilaterals are figures with four sides: they are called Quadrangles also, because they have four angles.

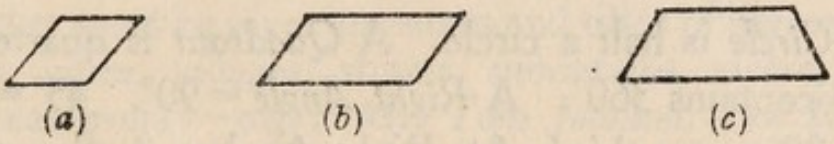


A Square has four equal sides and four right angles.



A Rectangle or Oblong has its opposite sides equal and its angles are right angles.

GEOMETRY DEFINITIONS—continued.



(*a*) A Rhombus has four equal sides but its angles are not right angles.

(*b*) A Parallelogram is a quadrilateral whose opposite sides are parallel.

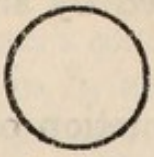
(*c*) A Trapezium is a quadrilateral of which two sides are parallel.

A Diagonal is the line joining the opposite angles of a quadrilateral.

A Diameter is the line joining the centres of opposite sides of a quadrilateral.

A *Polygon* is a plane figure bounded by more than four straight lines. It is regular when all its sides and angles are equal.

A Regular Pentagon is a figure with five equal angles and five equal sides; Hexagon, six; Heptagon, seven; Octagon, eight; Nonagon, nine; Decagon, ten; Undecagon, eleven; Duodecagon, twelve.



A *Circle* is a plane figure bounded by one line called a circumference, and is such that all lines drawn from a point within the figure to the circumference are equal. The point is called the Centre. Each of these lines is called a Radius. A *Diameter* is a straight line through the centre from circumference to circumference. A *Chord* is a straight line across a circle, but not through the centre. A *Tangent* is a line touching a circle. An *Arc* is any part of the circumference.

GEOMETRY DEFINITIONS—continued.

A *Semi-Circle* is half a circle. A *Quadrant* is quarter of a circle. A *Circle* contains 360°. A *Right Angle* = 90°. 45° = half a Right Angle. 30° = one-third of a Right Angle. A *Segment* is a piece cut off a circle by a chord. A *Sector* is a part of a circle enclosed by an arc and two radii.

An *Ellipse* is a figure bounded by a continuous curved line, and is longer than it is broad. A true Ellipse is not oval or egg-shaped. The Major Axis is longer than the Minor Axis.

Solids have length, breadth, and height (or depth, or thickness) and have two or more surfaces, as a cone, cylinder, cube, pyramid, prism or sphere.

A *Model* or Perspective drawing represents an object (sometimes in outline only) as it appears to the eye. Distant objects appear small. Receding parallel lines are drawn towards each other. The axes of cones and cylinders must be drawn at right angles to the axes of their bases.

A *Plan* is a drawing of the actual shape of the surface covered by an object viewed from above. An *Elevation* is a drawing of the actual shape of the surface covered by an object viewed from the front or side.

A *Scale* drawing is the representation of an object one-half, one-third, one-tenth or some other fraction of its real size. Scale $\frac{1}{2}$ means that a line $\frac{1}{2}$ in. long represents something which is 1 in. long; and a line 6 in. long represents something 12 in. long; scale $\frac{1}{10}$ means that $\frac{1}{10}$ inch represents 1 inch; and $\frac{12}{10}$ inch represents 12 inches, or 1 foot. Scale $\frac{1}{8}$ means $\frac{1}{8}$ inch represents 1 inch; and $\frac{3}{8}$ inch represents 3 inches; and $\frac{12}{8}$ inch represents 12 inches. Scale $\frac{1}{12}$ means that $\frac{1}{12}$ inch represents 1 inch; $\frac{5}{12}$ inch represents 5 inches; $\frac{12}{12}$ inch represents 12 inches; $\frac{17}{12}$ inch represents 17 inches.

ENGLISH.

CAPITAL LETTERS must be given to names and titles of persons, countries, provinces, cities, villages, streets, mountains, rivers, seas, ships, feasts, great events—e.g.: *Mr. Tom Johnson, The Royal George, Church St., The Boer War, Mt. Vesuvius;* the pronoun *I;* the interjection *Oh!*; adjectives like *English, Irish, French, Spanish;* the first word of every sentence, quotation, or line of poetry; the names of the principal articles in catalogues, bills, titles of books, addresses on envelopes; and to all names and titles of God, as *The Almighty, Jehovah, The Saviour.* The letter next after a full stop is always a capital.

FULL STOPS (or periods) must be placed at the end of every sentence and abbreviation: e.g., *The Romans landed B.C. 55. Sing. Num. Neut. Gen. Oct. Sep. Nov.*

QUOTATION MARKS AND INVERTED COMMAS. The exact words spoken by someone, or quoted from a book, must be placed within quotation marks—e.g., *The boy cried, "Mary is here." "Come to me," said Jack.*

A point of INTERROGATION is placed after every question—e.g., *Where are you? Have you seen my brother?*

An EXCLAMATION point follows such words as *Oh! Alas! Hurrah! Hush!*

The APOSTROPHE denotes ownership or else the omission of a letter—*Jane's; John's; Boys'; I'll; Can't; O'er; E'er; Didn't.* The Apostrophe and S follow all possessive singular nouns—*The boy's book; Tom's hat; Mr. Jones's coat;* The apostrophe *only* follows a plural noun which ends in S, as *Six boys' coats are now ready.* A plural noun which does not end in S takes both the Apostrophe and S, as *The men's dinners; The children's boots.* Pronouns do not require the Apostrophe, as *Hers, Yours, Its, His, Theirs.*

CORRECT SPELLING is very important. Notice particularly words which are sounded much alike:—*There, their; where, were; as, has; whether, weather; hear, here; pane, pain; story, storey; to, too, two; of, off; kernel, colonel; desert, dessert; tail, tale; grate, great; hare, hair.*

COMMON ERRORS. I *be* a good cricketer (am). He went to *lay* down (lie). That *aint* right (is not). He never *done* anything (did). I could have *went* (gone). It *do* not matter (does). It *have* contracted (has).

ENGLISH—continued.

Let *I* do it (me). He went *their* (there). We saw *there* house (their). *Has* he *as* been before (As he has). I have no books for *they* (them). That was *her* (she). I know *who* I saw (whom). He stands between you and *I* (me). The lion *who* chased us is dead (which). We know the man *which* watched us (who). I never did *nothing* (anything). We *was* going (were).

When writing a letter, put the address and date at the top. Sign your full name at the end, and then write the title (Mr., Esq., Mrs., Miss) and address of the person to whom the letter is sent.

Do not use the superlative degree of adjectives, as *tallest, most beautiful,* instead of the comparative, as taller, more beautiful, when comparing TWO things.

Adjectives should not be used for adverbs, as He ran very *quick* (quickly). Use *and, but, then,* and *so* as seldom as possible, especially at the beginning of a sentence.

Do not use pronouns so often as to confuse two persons together—He told *him he* was going to *his* house. Before using a pronoun be sure that you have given the noun almost immediately before it. Observe the rules of punctuation given above.

FORMATION OF PLURALS OF NOUNS.

Number is the distinction in the form of a word to show whether reference is made to one object, or more than one.

There are two numbers—singular and plural. Singular denotes one thing, e.g., *girl, hat.* Plural denotes more than one, e.g., *girls, hats.*

The plural is formed in several ways :—

1. By adding *s* or *es*, e.g., *boy, boys ; grass, grasses.*
2. By changing *f* or *fe* into *ves*, e.g., *calf, calves ; knife, knives ; half, halves.*
3. By changing *y* into *ies*, e.g., *lady, ladies ; baby, babies.*
4. By changing the body of the word, e.g., *man, men ; mouse, mice.*

In some cases the word is alike for singular and plural, e.g., *deer, fish, sheep, species.*

Compound nouns form the plural by adding *s* to the principal word in the compound, e.g., *aide-de-camp, aides-de-camp ; court-martial, courts-martial ; maid-servant, maid-servants.*

FOREIGN WORDS AND PHRASES COMMONLY MET WITH IN READING.

À bas—down with.

ab initio—from the beginning.

ad infinitum—to infinity.

à droite—to the right.

a fortiori—with stronger reason.

à la mode—in the fashion.

alma mater—foster mother.

amour-propre—self esteem.

aqua vitae—water of life (brandy).

anno Domini—in the year of our Lord A.D.

arrière-pensée—after-thought.

au fond—at the bottom.

au revoir—good-bye until we meet again.

ad finem—at the end.

agenda—things to be done.

al fresco—in the open air.

à la française—after the French mode.

ante meridiem—before noon, a.m.

à pied—on foot.

arc de triomphe—triumphal arch.

blasé—surfeited.

bona fide—genuine.

bel esprit—brilliant mind.

bête noire—an object of dislike.

bizarre—fantastic.

bon ami—good friend.

bonhomie—good nature.

bonjour—good day.

bon marché—cheap market.

bon voyage!—a pleasant journey to you!

canaille—rabble, mob.

cap-à-pie—from head to foot.

carte blanche—a free hand.

chef d'œuvre—a masterpiece.

comme il faut—as it should be.

confrère—an associate.

cul-de-sac—a narrow passage not open at both ends.

café au lait—coffee with milk.

café noir—black coffee.

chanson—a song.

charmante—a charming lady.

chef de cuisine—a male head-cook.

compos mentis—of sound mind.

congé d'élire—a leave to elect.

FOREIGN WORDS AND PHRASES COMMONLY MET WITH IN READING—continued.

coup d'état—a revolutionary measure.

coup de grâce—a finishing stroke.

de novo—anew.

Dieu et mon droit—God and my Right.

de trop—too much; in the way.

dramatis personnæ—characters represented in drama.

eau-de-vie—water of life (brandy).

en route—on the way.

entrée—one of the courses at a dinner.

esprit de corps—brotherly feeling.

eureka—I have found it.

exeunt—they go out.

ex officio—by virtue of office.

élite—pick, choice.

en fête—keeping holiday.

en masse—in a body.

en suite—in company.

entente—understanding.

entente cordiale—evidences of goodwill.

et cetera (etc.)—and the rest.

exit—he goes out.

extempore—without preparation; impromptu.

facsimile—a close imitation.

factotum—do all.

finis—the end.

faux pas—false step; slip.

gardez—take care; keep.

grâce à Dieu—thanks to God.

ich dien—I serve.

id est, i.e.—that is.

il penseroso—the melancholy one.

in excelsis—in the highest.

in vacuo—in empty space.

infra dig—below one's dignity.

in statu quo—in its former state.

in toto—entirely.

jet d'eau—a fountain.

laissez faire—let alone.

l'allegro—the merry man.

locum tenens—a deputy.

matinée—afternoon performance.

mêlée—a scuffle or scrimmage.

morceau—a piece.

FOREIGN WORDS AND PHRASES COMMONLY MET WITH IN READING—continued.

née—born.

noblesse oblige—rank has its obligations.

nom de plume—an assumed name.

nota bene, n.b.—mark well.

on dit—they say.

ora pro nobis—pray for us.

par excellence—pre-eminently.

pax vobiscum—peace be with you.

per annum—by the year.

per centum—by the hundred.

per contra—by the opposite.

per diem—by the day.

per se—by itself.

post mortem—after death.

prima donna—first lady.

quasi—in a manner.

quantum—quantity.

qui vive—on the alert.

quod erat demonstrandum, Q.E.D.—which has to be proved.

quod erat faciendum, Q.E.F.—which was to be done.

raison d'être—the reason of being.

recherché—refined.

reductio ad absurdum—reducing to absurdity.

répondez s'il vous plaît, R.S.V.P.—reply if you please.

resumé—summary.

sang-froid—cold blood.

sub-rosa—privately.

sans doute—without doubt.

tableau vivant—living tableaux or groups.

table d'hôte—common table for guests.

tempus fugit—time flies.

terra cotta—baked earth.

terra firma—solid earth.

Te Deum—We praise thee, O Lord.

ultimatum—final condition.

valet de chambre—an attendant.

versus—against.

videlicet (viz.)—namely.

vice versa—the reverse.

viva voce—by the living voice.

via—by the way of.

vis à vis—opposite.

verbatim—word for word.

ESSENTIAL DATES OF BRITISH HISTORY.

Making of English Nation.	B.C. 55	Roman Julius Cæsar visits Britain.	Roman Britain.
	A.D. 410	Romans leave Britain.	
	449–613	English Conquest.	English Settlement.
	597	St. Augustine's Christian Mission.	
	664	Synod of Whitby.	
	871–901	Alfred the Great's reign.	Danish Conquest
	1066	Norman Conquest begins.	Norman Conq'st
Foundation of Law and Parliament.	1215	Magna Charta sealed.	Angevin or Plantagenet.
	1295	Model Parliament meets.	
	1314	Scotch win Independence at Bannockburn.	
Struggles for National and Personal Liberty.	1346–9	Black Death.	
	1381	Peasants' Revolt.	
	1415	Battle of Agincourt.	
	1429	Joan of Arc saves France.	Lancaster and York.
	1476	Caxton's Printing Press.	
Age of Discovery and Reformation.	1485	Tudor Monarchy set up.	Tudors.
	1492	Columbus discovers America.	
	1534	Act of Supremacy.	
	1588	Armada defeated.	
Struggle for Constitutional Government.	1620	Pilgrim Fathers land in America.	Stuarts.
	1649	Charles I beheaded.	
	1662	Act of Uniformity.	
	1688	"Glorious Revolution."	
	1707	Union of England and Scotland.	Hanoverians.
	1720	Walpole, first Prime Minister.	
	1745	Last Jacobite Rebellion.	
	1757	Plassey and India (Clive).	
Colonial Rivalries and Revolution.	1759	Quebec and Canada (Wolfe).	
	1776	American Independence.	
	1789	French Revolution.	
	1805	Battle of Trafalgar.	
	1815	Napoleon defeated at Waterloo.	
	1825	Stephenson's first Railway.	
Growth of Democracy and Self-Government.	1832	Reform of Parliament.	
	1846	Repeal of Corn Laws.	
	1867	Dominion of Canada formed.	
	1870	Elementary Education Act.	
	1871	Trade Unions legalized.	
	1888	County Councils established.	
	1900	Australian Commonwealth established.	
	1909	Union of South Africa.	
World Rivalries and Settlements.	1914	The Great World War.	Windsor.
	1919	Peace of Versailles and League of Nations.	
	1922	Irish Free State established.	
	1923	Treaty of Lausanne between Allies and Turkey.	
	1936	Death of King George V.	
	1936	Accession of Edward VIII.	
	1936	Abdication of Edward VIII.	
	1936	Accession of George VI.	

NOTEWORTHY TEMPERATURES.

Centigrade degrees.	
7,000	The Sun.
3,500	The electric arc.
1,530	Iron melts.
1,083	Copper melts.
961	Silver melts.
400	Coal ignites at about this temperature.
357	Mercury boils.
327	Lead melts.
113·5	Iodine melts.
100	Water boils (212°F.)
79	Alcohol boils.

Centigrade degrees.	
53	Highest shade temperature recorded.
36·9	Temperature of human body in health (98·4°F.)
0	Water freezes (32°F.).
–39	Mercury freezes.
–41	Temperature North Pole, January.
–61·7	Record natural lowest temperature.
–130	Alcohol freezes.
–183	Oxygen liquefies.
–273·1	The absolute zero.

Gases. Air is a mixture of gases, chiefly Oxygen and Nitrogen.

Oxygen. One-fifth of air. The life-giving gas, rekindles a glowing splinter. Colourless, odourless. Usually prepared by heating a mixture of Potassium Chlorate and Manganese Dioxide.

Nitrogen. Four-fifths of air. Colourless, odourless. Will not support life. Extinguishes a lighted taper. Usually prepared by heating a solution of Ammonium Chloride and Sodium Nitrite.

Hydrogen. Water is a compound of oxygen and hydrogen. Colourless, odourless. Burns with a pale blue flame. Explosive with air. Lightest substance known. May be prepared by action of dilute Sulphuric Acid on Zinc.

Carbon Dioxide. One of the gases of expired air. Colourless, odourless. Very heavy gas. Will not support life. Extinguishes a lighted taper. Turns lime water milky. May be prepared by the action of dilute Hydrochloric Acid on Marble chippings.

Ammonia. Colourless gas with a pungent odour. Can easily be liquefied. Solution may be used for reviving fainting people. May be prepared by heating a mixture of slaked lime and Ammonium Chloride.

COMMON METALS AND THEIR USES.

MAGNESIUM (silvery white). When heated in air Magnesium burns with a brilliant white light. It is therefore used in photography and in the making of fireworks.

ALUMINIUM (bluish white). Very light in weight and fairly hard, so used in the making of airships and aeroplanes. Also, in the manufacture of domestic utensils.

ZINC (bluish white). Used in electric cells, e.g., Leclanché cell for electric bell. Also for the preparation of the gas Hydrogen.

CAST IRON. The brittle form of iron. Used for cheap ironwork.

WROUGHT IRON. Very malleable. Horse shoes. Cores for electro-magnets.

STEEL. Very commonly used. Railway lines, machinery, bridges, and general constructional work.

TIN (lustrous white). Stable in moist air. Many important applications. Tin-foil. Tin-plate. Bronze. Pewter. Solder.

Common Metals and their Uses—continued.

COPPER (reddish brown). An extremely good conductor of electricity, therefore widely used in electrical work as copper wire and lightning conductors.

SILVER (lustrous white). Silver coinage (much used by jeweller and silversmith), also electro-plating.

LEAD (silvery white). Soon tarnishes to a bluish-grey colour. Lead piping. Making of solder and type metal.

MERCURY (silvery white). The only metal which is a liquid at ordinary temperatures. Used in thermometers and Mercury barometers.

SEASONS.

Spring begins ..	21st March ..	Spring Equinox ..	12 hours day 12 hours night
Summer „ ..	21st June ..	Summer Solstice ..	longest day
Autumn „ ..	23rd Sept. ..	Autumnal Equinox. .	12 hours day 12 hours night
Winter „ ..	22nd Dec. ..	Winter Solstice ..	shortest day

Quarter Days:
- Lady Day, March 25th.
- Midsummer Day, June 24th.
- Michaelmas Day, September 29th.
- Christmas Day, December 25th.

Half Quarter Days: February 8th ; May 9th ; August 11th ; November 11th.

Thirty days hath September,
April, June, and November,
All the rest have thirty-one,
Excepting February alone
Which hath twenty-eight days clear,
And twenty-nine each Leap Year.

NOTE.—When the date is divisible by 4 without remainder, it is Leap Year, as 1908 ; but with the even hundreds :—1600, 1800, 1900, the *first two figures* must be divisible by 4 if it is a Leap Year.

EUROPE.

	Countries.	*Capitals.*	*Government.*
1.	Great Britain	London	Monarchy.
2.	Ireland	Belfast	Northern Ireland—Self-Government.
		Dublin	Irish Free State—Self-Gov. Dom.
3.	France	Paris	Republic.
4.	Spain	Madrid	Republic.
5.	Portugal	Lisbon	Republic.
6.	Holland	The Hague	Monarchy.
7.	Belgium	Brussels	Monarchy.
8.	Germany	Berlin	Republic.
9.	Switzerland	Berne	Republic.
10.	Italy	Rome	Monarchy.
11.	Czecho-Slovakia	Prague	Republic.
12.	Austria	Vienna	Republic.
13.	Hungary	Budapest	Monarchy.
14.	Yugo-Slavia	Belgrade	Monarchy.
15.	Albania	Tirana	Republic.
16.	Greece	Athens	Monarchy.
17.	Bulgaria	Sofia	Monarchy.
18.	Rumania	Bucharest	Monarchy.
19.	Poland	Warsaw	Republic.
20.	Lithuania	Kovno	Republic.
21.	Latvia	Riga	Republic.
22.	Esthonia	Reval	Republic.
23.	Denmark	Copenhagen	Monarchy.
24.	Norway	Oslo	Monarchy.
25.	Sweden	Stockholm	Monarchy.
26.	Finland	Helsingfors	Republic.
27.	Ukraine	Kharkov	Soviet.
28.	Russia	Moscow	Soviet.

"SAFETY FIRST."

1. Before crossing the road—
   (*a*) Look to the right.
   (*b*) Look to the left.
2. The shortest way across the road is the straightest.
3. If your ball goes into the road, wait until all is clear before recovering it.
4. Avoid playing games which make you run into the road.
5. Do not step out from behind any vehicle which prevents your seeing what is coming the other way.
6. Instead of walking in the middle of the road or street, use the footpath if there is one.
7. A moment's thought may save a month in hospital.
8. Never enter or leave a vehicle while it is in motion.
9. It is safer and healthier to play in public parks and open spaces rather than in the roadway.

LETTERING FOR MAPS, etc.

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
a b c d e f g h i j k l m n o p q r s t u v w x y z 1 2 3 4 5 6 7 8 9 0

𝔄 𝔅 ℭ 𝔇 𝔈 𝔉 𝔊 ℌ ℑ 𝔍 𝔎 𝔏 𝔐 𝔑 𝔒 𝔓 𝔔
ℜ 𝔖 𝔗 𝔘 𝔙 𝔚 𝔛 𝔜 ℨ. 𝔞 𝔟 𝔠 𝔡 𝔢 𝔣 𝔤 𝔥 𝔦 𝔧 𝔨
𝔩 𝔪 𝔫 𝔬 𝔭 𝔮 𝔯 𝔰 𝔱 𝔲 𝔳 𝔴 𝔵 𝔶 𝔷.

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
a b c d e f g h i j k l m n o p q r s t u v w x y z 1 2 3 4 5 6 7 8 9 0

A B C D E F G H I J K L M N O P Q R S T U V
W X Y Z. 1 2 3 4 5 6 7 8 9 0.

A B C D E F G H I J K L M N O P Q R S T
U V W X Y Z. 1 2 3 4 5 6 7 8 9 0.

INDEX.

	PAGE
ARITHMETICAL TERMS, SIGNS, etc.	1
MULTIPLICATION TABLES	2
FARTHINGS, PENCE, AND SHILLINGS TABLES ...	3
TABLE OF FACTORS	3
ROMAN NOTATION TABLE	4
WEIGHTS AND MEASURES	4 & 5
PRACTICE TABLES	6
INVOLUTION	7
VULGAR AND DECIMAL FRACTIONS	7
INTEREST AND DISCOUNT	7
ALGEBRAIC FACTORS	7
METRIC SYSTEM	8
MENTAL ARITHMETIC AIDS	9 & 10
RAPID DECIMALISATION OF MONEY	11
GEOGRAPHICAL DEFINITIONS	12, 13, 14
GEOMETRY DEFINITIONS	...15, 18, 19, 20
ENGLISH	21, 22
FOREIGN WORDS AND PHRASES COMMONLY MET WITH IN READING	23, 24, 25
ESSENTIAL DATES OF BRITISH HISTORY	26
NOTEWORTHY TEMPERATURES	27
GASES	27, 28
COMMON METALS AND THEIR USES	28 & 29
THE SEASONS	29
COUNTRIES, CAPITALS, AND GOVERNMENTS OF EUROPE	30
LETTERING FOR MAPS, etc.	31
"SAFETY FIRST"	31
MAP OF THE WORLD	16, 17

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