THE APPLETON ARITHMETICS, SECOND BOOK

Published @ 2017 Trieste Publishing Pty Ltd

ISBN 9780649060139

The Appleton Arithmetics, Second Book by J. W. A. Young & Lambert L. Jackson

Except for use in any review, the reproduction or utilisation of this work in whole or in part in any form by any electronic, mechanical or other means, now known or hereafter invented, including xerography, photocopying and recording, or in any information storage or retrieval system, is forbidden without the permission of the publisher, Trieste Publishing Pty Ltd, PO Box 1576 Collingwood, Victoria 3066 Australia.

All rights reserved.

Edited by Trieste Publishing Pty Ltd.
Cover @ 2017

This book is sold subject to the condition that it shall not, by way of trade or otherwise, be lent, re-sold, hired out, or otherwise circulated without the publisher's prior consent in any form or binding or cover other than that in which it is published and without a similar condition including this condition being imposed on the subsequent purchaser.

www.triestepublishing.com

J. W. A. YOUNG & LAMBERT L. JACKSON

THE APPLETON ARITHMETICS, SECOND BOOK

Trieste

THE APPLETON ARITHMETICS

BY

J. W. A. YOUNG, PH.D.

ASSOCIATE PROFESSOR OF THE PEDAGOGY OF MATHEMATICS
THE UNIVERSITY OF CHICAGO

AND

LAMBERT L. JACKSON, PH.D.

FORMERLY PROFESSOR OF MATHEMATICS, STATE NORMAL SCHOOL
BROCKPORT, NEW YORK

SECOND BOOK

NEW YORK
D. APPLETON AND COMPANY
1911

Educ T 119.11.890 fi k2

HARVARD COLLEGE LIBRARY
GIFT OF
GEORGE ARTHUR PLIMPTON
JANUARY 25, 1924

COPYRIGHT, 1909, BY
D. APPLETON AND COMPANY

PREFACE

THE present volume of THE APPLETON ARITHMETICS covers the work usually taught in the fifth and the sixth grade, beginning with a brief review of the work of the primary grades, and then providing a course that covers the essentials of elementary arithmetic.

Like the other Books, this text is for the *pupils'* use, and as such possesses certain well-defined features. Important definitions, principles, and processes are introduced inductively by means of a series of questions and illustrations labeled "Preparatory." A natural and easy approach to the subject is thus provided for the pupil, without, however, placing hard and fast limitations on the teacher's method. When a principle or process has been developed and stated, it is put into practice through easy Oral Exercises which are followed by Written Exercises, of gradually increasing difficulty and including applications that require somewhat extended calculations.

In addition to giving proper attention to the culture value peculiar to the exact reasoning of school mathematics, this book fully recognizes the utility of arithmetic. The problem material is rich in data drawn from the pupil's experience. School subjects like manual training, domestic art, geography, nature study, and drawing have furnished many problems; and the everyday occupations and industries of the average community

are made to contribute their share of applications. Finally, the larger interests of the community, such as production, transportation, communication, and government, have not been neglected as sources for problems of interest and value.

In all of this, arithmetic is made the subject of study and the core of the instruction, without, however, sacrificing the pupil to abstract number drill; and the whole subject is classified and labeled in harmony with a logical development.

It is thought that the classroom work will be facilitated by the oral and written work, properly labeled; the well-balanced abstract and concrete drill; the frequent and systematic reviews; the classified tables of measurement, and the attempt to supplement and strengthen the text by careful typography and effective illustration.

THE AUTHORS.

CONTENTS

PAGES

REVIEW AND PREPARATION 1–14

Notation and Numeration 1
Addition and Subtraction 2
Multiplication 4
Division 5
Common and Decimal Fractions 6
Denominate Numbers 8
Business Arithmetic 10
PROBLEMS 10

CHAPTER I: PROCESSES WITH INTEGERS 15–58

Notation and Numeration 15
Addition 17
Subtraction 20
Making Change 22
Multiplication 25
By 10 and by 100 27
Multipliers Containing Zeros 28
Dollars and Cents 29
Powers 30
Division 32
By 10 and by 100 35
Long Division 37
Cash Accounts 40
Money Orders 42
Keeping Store 44
Postage Problems 46
Factors and Multiples 47
Divisibility 47
Factors and Divisors 48
Common Divisors 49
Multiples 51
Cancellation 53
REVIEW 54

CHAPTER II: COMMON FRACTIONS 59–98

Comparison 63
Reduction 64
To Higher or Lower Terms. 64
To a Common Denominator. 67
Addition and Subtraction 69
Addition 69
Subtraction 71
Mixed Numbers 73

PAGES

Multiplication 77
A Fraction by an Integer... 77
An Integer by a Fraction... 79
A Fraction by a Fraction... 81
With Mixed Numbers..... 83
Division 86
Unity by Any Fraction..... 86
Any Integer by a Fraction.. 87
A Fraction by a Fraction.. 88

PAGES

Division (*continued*)
A Fraction by an Integer.. 89
With Mixed Numbers..... 90
To Find What Part One Number Is of Another... 91
To Find the Whole When a Fractional Part Is Given 92
Complex Fractions..... 93
REVIEW 94

CHAPTER III: DECIMAL FRACTIONS 99–120

Notation and Numeration.... 99
Tenths and Hundredths... 99
Thousandths..... 101
Addition and Subtraction..... 103
Multiplication..... 105
A Decimal by an Integer.. 105
A Decimal by 10 and by 100 107
Bills..... 108
Division..... 111
A Decimal by an Integer.. 111
A Decimal by 10 and by 100..... 112
Reduction..... 114
A Decimal Fraction to a Common Fraction..... 114
A Common Fraction to a Decimal Fraction..... 114
REVIEW..... 117

CHAPTER IV: DENOMINATE NUMBERS..... 121–153

Measures of Capacity..... 121
Liquid Measure..... 121
Dry Measure..... 121
Measures of Weight and Value 122
Avoirdupois Weight..... 122
Troy Weight..... 123
Apothecaries' Weight..... 123
United States Money..... 123
Measures of Time..... 125
Measuring by Twelves..... 125
Measures of Length, Area, and Volume..... 126
Linear Measure..... 126
Square Measure..... 126
Cubic Measure..... 126
Angular Measure..... 128
Processes with Denominate Numbers..... 130
Reduction..... 130
Addition and Subtraction.. 131
Multiplication..... 132
Division..... 133

PAGES

Applications of Denominate Numbers 136
Measuring Surfaces 136
Measuring Volume 144
Applications of Denominate Numbers (*continued*)
Finding the Difference between Dates 149
REVIEW 151

CHAPTER V: THE SOLUTION OF PROBLEMS 154–169

Unitary Analysis 156
Approximating Results 158
Ratio 160
The Use of Letters 163
Number Pictures, or Graphs .. 165
REVIEW 168

CHAPTER VI: DECIMAL FRACTIONS—PERCENTAGE .. 170–191

Decimal Fractions 170
Notation and Numeration 170
Reduction of a Decimal Fraction to a Common Fraction 171
Reduction of a Common Fraction to a Decimal Fraction 172
Addition and Subtraction. 172
Multiplication 174
Division 176
Percentage 178
Meaning of Rate Per Cent. 178
Finding a Percentage 180
Finding How Many Per Cent One Number Is of Another 182
Finding a Number from a Given Percentage 184
REVIEW 186

CHAPTER VII: BUSINESS APPLICATIONS 192–214

Gain and Loss 192
Commission 194
Trade Discount 196
Interest 197
Interest for a Fraction of a Year 201
Banking 202
Savings Accounts 204
Taxes and Duties 205
Insurance 207
Rates of Insurance 208
REVIEW 212

GENERAL REVIEW 215–230

TABLES 231, 232

INDEX 233