

A Course Module for

# Teaching Math in the Intermediate Grades

Riza C. Gusano  
Mark Zoel J. Masangkay  
Lady Angela M. Rocena  
Melanie C. Unida  
Authors

Greg Tabios Pawilen  
Coordinator



A Course Module for

# **Teaching Math in the Intermediate Grades**

Riza C. Gusano  
Mark Zoel J. Masangkay  
Lady Angela M. Rocena  
Melanie C. Unida  
Authors

Greg Tabios Pawilen  
Coordinator



Published & Distributed by

**REX Book Store**

856 Nicanor Reyes, Sr. St.  
Tel. Nos. 736-05-67 • 735-13-64  
1977 C.M. Recto Avenue  
Tel. Nos. 735-55-27 • 735-55-34  
Manila, Philippines  
[www.rexpublishing.com.ph](http://www.rexpublishing.com.ph)





Philippine Copyright 2020  
by Rex Book Store, Inc.

# **RBS Teaching Mathematics in the Intermediate Grades**

First Edition

ISBN 978-621-04-0375-6

Classification: Module (04-ED-00057-0)

Reprinted: November 2020

Published, copyrighted 2020, and distributed by **Rex Book Store, Inc. (RBSI)** with main office at 856 Nicanor Reyes Sr. St., Sampaloc, Manila/Tel. Nos.: 735-1364, 736-0567

## **RBSI Branches:**

### **LUZON**

•**MORAYTA:** 856 N. Reyes Sr. St., Sampaloc, Manila / Tel. Nos.: 736-0169, 733-6746; Telefax: 736-4191 • **RECTO:** 2161-65 Freedom Building, C.M. Recto Avenue, Sampaloc, Manila / Tel. Nos.: 522-4521, 522-4305, 522-4107, 733-8637 • **RECTO (La Consolacion):** Mendiola, Manila • **MAKATI:** Unit UG-2, Star Centrum Bldg., Sen. Gil Puyat Ave., Makati City / Tel. No.: 818-5363; Telefax: 893-3744 • **ROCKWELL:** 1st Floor, Ateneo Professional School, Rockwell Center, Bel-Air, Makati City / Tel. No.: 729-2015 • **CUBAO:** Unit 10 UGF, Doña Consolacion Bldg., Gen. Santos Ave., Araneta Center, Cubao, Quezon City / Telefax: 911-1070 • **ORTIGAS:** G/F Tektite East Tower, Exchange Road, Philippine Stock Exchange Centre, Ortigas Center, Pasig City / Tel. No.: (02) 650-4347 • **CAVITE (Dasmariñas):** Block 4, Lot 20 Don Gregorio Heights 2, Zone 1-A Aguinaldo Highway, Dasmariñas, Cavite / Telefax: (046) 416-1824 • **CAVITE (Tanza):** (Display Area) Block 5, Lot 6, City View 4 and 5, Brgy. Tanauan, Tanza, Cavite • **NAGA:** 1-1A Geronimo Bldg., Barlin St., Sta. Cruz, Naga City, Camarines Sur/Telefax: (054) 811-6878 • **LEGAZPI:** Unit 6, 3rd Floor, A. Bichara Silverscreen, Legazpi City, Albay / Telefax: (052) 480-2244 • **CALAPAN:** Brgy. Salong, National Highway, Calapan City, Oriental Mindoro / Telefax: (043) 288-1650 • **BATANES:** L. Lopez St., Kayvaluganan, Basco, Batanes Tel. Nos.: (02)681-9085, 330-4937 • **TUGUEGARAO:** 10 Arellano Ext. St., Brgy. Ugac Sur, Tuguegarao, Cagayan / Telefax: (078) 844-8072 • **CABANATUAN:** Fontelera Building, 1271 Del Pilar Ext., Sangitan East, Cabanatuan City, Nueva Ecija / Tel. No.: (044) 464-2151; Telefax: (044) 600-5684 • **URDANETA:** Zone 6, Pinaludpod, Urdaneta City, Pangasinan / Telefax: (075) 568-3975 • **ANGELES:** Unit H, JMS Bldg., MacArthur Highway, Brgy. Salapungan, Angeles City, Pampanga/Telefax: (045) 887-5371 • **BAGUIO:** Rex Hall Student Residences, Upper Gen. Luna cor. A. Bonifacio St., Baguio City, Benguet / Tel. No.: (074) 422-0574 • **BATANGAS:** J.P. Laurel Highway, Mataas na Lupa, Tambo, Lipa, Batangas / Tel. No.: (043)741-6614 • **PALAWAN:** Abad Santos St. cor. Valencia St., Puerto Princesa, Palawan

### **VISAYAS**

•**TACLOBAN:** Brgy. 74 Marasbaras, Tacloban City, Leyte / Tel. No.: (053) 323-8976; Telefax: (053) 523-1784 • **ILOILO:** 75 Lopez Jaena St., Brgy. San Isidro, Jaro, Iloilo City, Iloilo / Tel. No.: (033) 329-0332; Telefax: (033) 329-0336 • **BACOLOD:** 28 Brgy. 36, Purok Immaculada, Quezon Ave., Bacolod City, Negros Occidental • **CEBU:** 11 Sanciangko St., Cebu City / Tel. Nos.: (032) 416-9684, 254-6773, 505-4313; Telefax: (032) 254-6466

### **MINDANAO**

•**CAGAYAN DE ORO:** J. Serina St. cor. Vamenta Blvd., Carmen, Cagayan de Oro City, Misamis Oriental / Telefax: (088) 858-6775, 309-5881 • **DAVAO:** 156 C.M. Recto St., Davao City, Davao / Tel. Nos.: (082) 300-5422, 305-5772; Telefax: (082) 221-0272 • **GENERAL SANTOS:** Aparente St., Dadiangas Heights, General Santos City, South Cotabato / Telefax: (083) 554-7102 • **ZAMBOANGA:** San Francisco Loop, Mayor Agan Ave., Camino Nuevo B, Zamboanga City / Tel. No.: (062) 955-0887

[www.rexpublishing.com.ph](http://www.rexpublishing.com.ph)

No portion of this book may be copied or reproduced in books, pamphlets, outlines, or notes—whether printed, mimeographed, typewritten, photocopied, or in any form—for distribution or sale, without the written permission of the Publisher and Author/s. The infringer shall be prosecuted in compliance with copyright, trademark, patent, and other pertinent laws.


### **INTERNET LINK DISCLAIMER**

**Rex Book Store, Inc. (RBSI)** is not responsible for the accuracy, legality or content of the external sites and for that of subsequent links. These links are being provided as a convenience and for informational purposes only. Although verified at the date of publication, the publisher cannot guarantee that these links will work all of the time nor does it have control over the availability of linked pages.

Moreover, the publisher does not warrant sites or the servers that make them available are free of viruses or other harmful components. **Rex Book Store, Inc. (RBSI)** does not warrant or make any representations regarding the use or the results of the use of the materials in these sites or in third-party sites in terms of their correctness, accuracy, timeliness, reliability or otherwise.

**RBSI's Book Association Memberships:** Philippine Booksellers Association, Inc. (PBAI); Book Development Association of the Philippines (BDAP); Philippine Educational Publishers Association (PEPA); Book Exporters Association of the Philippines (BEAP); Academic Booksellers Association of the Philippines (ABAP); Children's Literature Association of the Philippines, Inc. (CLAPI); Asian Publishers Resources Center (APRC)

**PEPA's International Book Association Memberships:** International Publishers Association (IPA); Asia Pacific Publishers Association (APPA); ASEAN Book Publishers Association (ABPA); Philippine Book Publishing Development Federation (Philbook)

Printed by  **REX PRINTING COMPANY, INC.**

84-86 P. Florentino St., Sta. Mesa Heights, Quezon City / Tel. No.: 857-7777



## **Unit I: THE MATHEMATICS CURRICULUM IN THE INTERMEDIATE GRADES**

<b>Lesson 1:</b> Mathematics in the Intermediate Grades	2
<b>Lesson 2:</b> Mathematics Curriculum in the Intermediate Grades	7
<b>Lesson 3:</b> Constructivist Theory in Teaching Mathematics in the Intermediate Grades	13

## **Unit II: INSTRUCTIONAL PLANNING**

<b>Lesson 4:</b> The Teaching Cycle	18
<b>Lesson 5:</b> Things to Consider in Planning Instruction in Mathematics in the Intermediate Grades	23
<b>Lesson 6:</b> Instructional Planning Model	29

## **Unit III: INSTRUCTIONAL STRATEGIES FOR MATHEMATICS IN THE INTERMEDIATE GRADES**

<b>Lesson 7:</b> Problem-Solving	38
<b>Lesson 8:</b> Inductive Learning	48
<b>Lesson 9:</b> Concept Attainment	55
<b>Lesson 10:</b> Mathematical Investigation	62
<b>Lesson 11:</b> Design Thinking	68
<b>Lesson 12:</b> Game-based Learning	77
<b>Lesson 13:</b> Use of Manipulatives	82
<b>Lesson 14:</b> Values Integration	88
<b>Lesson 15:</b> Collaboration	96
<b>Lesson 16:</b> Teaching by Asking	104

## **Unit IV: ASSESSMENT STRATEGIES FOR MATHEMATICS IN THE INTERMEDIATE GRADES**

<b>Lesson 17: Assessing Learning</b>	<b>112</b>
<b>Lesson 18: Traditional Assessment</b>	<b>121</b>
<b>Lesson 19: Authentic Assessment</b>	<b>128</b>
<b>Lesson 20: Designing Learning Portfolios</b>	<b>139</b>
<b>References</b>	<b>147</b>
<b>Index</b>	<b>149</b>



## ABOUT THE MODULE

A Course Module for Teaching Math in the Intermediate Grades is a module which focuses on the important aspects of teaching mathematics in today's classroom. The main purpose of this module is to help future teachers have a grasp of what it means to teach and learn mathematics. It was written with the Filipino students as the ultimate beneficiaries in mind. Following the TEACH format—Think, Experience, Assess, Challenge, Harness—each chapter was designed to contain relevant information and varied learning exercises to aid teacher education institutions develop effective and innovative mathematics teachers.

## ABOUT THE AUTHORS



**Riza C. Gusano** finished her Doctor of Education in Educational Management at the Batangas State University and her Bachelor of Secondary Education major in Mathematics at the Immaculate Conception College in Batangas. She served as resource person, demonstration teacher, trainer, writer, and facilitator in various seminars on mathematics curriculum and instruction. At present, she is a supervising education program specialist at the Department of Education's Bureau of Curriculum Development. Her current project involves validating and reviewing DepEd mathematics learning materials in General Mathematics, Principles of Marketing, and Business Mathematics.



**Mark Zoel J. Masangkay** taught mathematics courses at the Ateneo de Manila High School for eight years. He is now a faculty member of the Mathematics Department of the University of the Philippines Integrated School (UPIS). He conducted various seminars and workshops for pre-service teachers. He graduated Bachelor of Secondary Education major in Mathematics minor in Chemistry (*cum laude*) from UP-Diliman. He is currently finishing his graduate research paper in the same institution.



**Lady Angela M. Rocena** is an assistant professor at the University of the Philippines (UP)-Diliman and a member of the Mathematics Department of UP Integrated School. She has actively taken part as trainer in teacher-training programs for the Department of Education and Department of Science and Technology. Her interest in students' mathematical thinking and teacher education compelled her to coauthor this book—a piece that she hopes would help teachers nurture students with mathematical habits of the mind. She earned her bachelor's degree in secondary education (*magna cum laude*) and her master's degree in mathematics education from UP College of Education.



**Melanie C. Unida** earned her bachelor's degree from St. Joseph's College under the Franciscan Sisters of Immaculate Conception scholarship and her master's degree from the Philippine Normal University. She is currently taking up doctorate classes in Educational Psychology major in Quantitative Analysis at the De La Salle University-Manila. Her teaching experience includes being a mathematics instructor in Kumon Method of Learning and a mathematics teacher in public junior high schools and in the college department of Sta. Isabel College. At present, she is a senior education program specialist in Bureau of Curriculum Development of the Department of Education, which is in charge of curriculum development, policy formulation, and teacher-training programs.

## ABOUT THE COORDINATOR

**Greg Tabios Pawilen** is an associate professor at the College of Human Ecology and at the Graduate School of the University of the Philippines-Los Baños (UPLB). He finished his Master of Arts in Education and Doctor of Philosophy in Education major in Curriculum Studies at UP-Diliman. He also finished his Master of Education in Curriculum Development at the Ehime University in Japan. He received the Academic Excellence Award from the UP College of Education for obtaining the highest general weighted average for his doctorate studies. He also received the prestigious Pi Gamma Mu Award for Academic Excellence in Social Sciences and a member of the Phi Kappa Phi International Honor Society.



Outcomes-Based Education (OBE) has become a powerful and engaging way of reforming the Philippine educational system. The highlight of OBE is the product—to develop the ideal graduates.

The Rex Book Store, Inc. tertiary textbooks are designed in compliance with the Commission on Higher Education's (CHED) requirements for OBE learning materials. The content, learning activities, and exercises aim to guide students to learn important knowledge and acquire skills to meet the CHED's prescribed competencies in specific programs.

[www.rexstore.com](http://www.rexstore.com)  
your online book catalog and book store



04-ED-00057-0



*We value your input.*

For comments or inquiries, email  
The Office of the Chief Operating Officer  
at [weare@rexpublishing.com.ph](mailto:weare@rexpublishing.com.ph)  
For more info about our products  
and services, please visit the following:  
[www.rexinteractive.com](http://www.rexinteractive.com)  
[www.rexpublishing.com.ph](http://www.rexpublishing.com.ph)  
[www.rexstore.com](http://www.rexstore.com)



ISBN 978-621-04-0375-6



9 786210 403756