

A Course Module for

Teaching Strategies for Elementary Science

(Physics, Earth, and Space Science)

Eden Joy Pastor Alata
Elen Joy Pastor Alata
Authors

Greg Tabios Pawilen
Coordinator



A Course Module for

Teaching Strategies for Elementary Science

(Physics, Earth, and Space Science)

Eden Joy Pastor Alata
Elen Joy Pastor Alata
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



Philippine Copyright 2020
by Rex Book Store, Inc.
and
Eden Joy Pastor Alata
Eden Joy Pastor Alata

RBS Teaching Strategies for Elementary Science
(Physics, Earth, and Space Science)

ISBN 978-621-04-0985-5

Classification: Module (64-10-00055-0)

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, 735-0567

RBSI Branches

LUZON

• **MORAYTA:** 856 N. Reyes Sr. St., Sampaloc, Manila / Tel. Nos.: 735-0165, 735-6746; Telefax: 735-4191 • **RECTO:** 2365-45 Freedom Building, C.M. Recto Avenue, Sampaloc, Manila / Tel. Nos.: 522-4521, 522-4905, 522-4107, 733-8697 • **RECTO (La Consolacion):** Mendirita, Manila • **MAKATI:** Unit UG-2, Star Centrum Bldg., Gen. Gil Puyat Ave., Makati City / Tel. No.: 818-5369; Telefax: 893-3744 • **ROCKWELL:** 1st Floor, Ateneo Professional School, Rockwell Center, Bel-Air, Makati City / Tel. No.: 775-2015 • **QUEZON:** Unit 10 UGF, Dola Consolacion Bldg., Gen. Santos Ave., Araneta Center, Cubao, Quezon City / Telefax: 911-1070 • **ORTIGAS:** G/F Teletel East Tower, Exchange Road, Philippine Stock Exchange Centre, Ortigas Center, Pasig City / Tel. No.: (02) 650-4347 • **CAVITE (Dasmarinas):** Block 4, Lot 20 Don Gregorio Heights 2, Zone 1-A Aguinaldo Highway, Dasmarinas, Cavite / Telefax: (045) 415-1824 • **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) 811-5878 • **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., Kaynallaganan, Basco, Batanes Tel. Nos.: (02) 681-9085, 330-4937 • **TUGUEGARAO:** 10 Arellano Ext. St., Brgy. Ugac Sur, Tuguegarao, Cagayan / Telefax: (078) 844-8072 • **CABANATUAN:** Fontanera Building, 1271 Del Pilar Ext., Sangitan East, Cabanatuan City, Nueva Ecija / Tel. No.: (044) 464-2151; Telefax: (044) 600-5684 • **URDANETA:** Zone 6, Pinnaludroad, 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) 422-9574 • **BATANGAS:** I.P. Laurel Highway, Matias na Lupa, Tambon, Lupa, Batangas / Tel. No.: (043) 741-5614 • **PALAWAN:** Abad Santos St. cor. Valencia St., Puerto Princessa, 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 City, Bacolod City, Negros Occidental • **CEBU:** 11 Sanclanjo St., Cebu City / Tel. Nos.: (032) 416-9684, 254-6773, 505-4313; Telefax: (032) 254-6466

MINDANAO

• **CAGAYAN DE ORO:** J. Serilla 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

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

Contents

Preface	v
---------------	---

UNIT I: THE ELEMENTARY SCIENCE CURRICULUM

Lesson 1: What is Science?	1
Lesson 2: Science Education	8
Lesson 3: Elementary Science Curriculum Physics, Earth, and Space Science	14
Lesson 4: Constructivist Theory in Teaching Science	20

UNIT II: INSTRUCTIONAL PLANNING

Lesson 5: Components of Instructional Planning.....	25
Lesson 6: Instructional Planning Cycle	30
Lesson 7: Five E Model in Planning Science Lessons	34
Lesson 8: Developing Instructional Plans for Elementary Science	42

UNIT III: INSTRUCTIONAL STRATEGIES FOR SCIENCE

Lesson 9: Strategy 1 - The Power of Observation	53
Lesson 10: Strategy 2 - Experimentation	63
Lesson 11: Strategy 3 - Inductive Guided Inquiry	71
Lesson 12: Strategy 4 - Cooperative Learning	78
Lesson 13: Strategy 5 - Using Research as a Teaching Strategy	86
Lesson 14: Strategy 6 - Using Case Study as a Teaching Strategy	96

Lesson 15: Strategy 7 - Using Role-play as a Teaching Strategy.....	107
Lesson 16: Strategy 8 - Gamification.....	117
Lesson 17: Strategy 9 - Design Thinking.....	123
Lesson 18: Suggested Activities that Explore Earth Science	133

UNIT IV: ASSESSMENT STRATEGIES FOR SCIENCE

Lesson 19: Assessing Learning in Science.....	137
Lesson 20: Traditional Assessment in Science.....	142
Lesson 21: Using Performance Task	145
Lesson 22: Designing Learning Portfolios	154
References.....	161
Index.....	167
About the Book	173

ABOUT THE MODULE

A Course Module for Teaching Strategies for Elementary Science (Physics, Earth, and Space Science) enables future science teachers to understand the intent, content, and structure of the elementary science curriculum and equips them with principles and elements of instructional planning, constructivist approach in teaching and learning, and various instructional and assessment strategies for elementary science. It also provides activities that foster understanding of spiraling basic science concepts and application of science inquiry in Physics and Earth and Space.

ABOUT THE AUTHORS



Eden Joy Pastor Alata is a full-time professor of the Biological Sciences Department, Centro Escolar University-Manila. She is a graduate of Master of Science in Biology at the De La Salle University-Manila and Bachelor of Science in Biology at the University of the East-Manila. She was granted a scholarship from the Department of Science and Technology-Philippine Council for Industry, Energy, and Emerging Technology Research and Development (DOST-PCIEERD) while taking up Master in Biology. She co-authored General Education Curriculum (GEC) textbooks *Understanding the Self and Science, Technology, and Society*.



Elen Joy Pastor Alata is the coordinator for English of the high school unit of St. Scholastica's College-Manila. She is also a Private Education Assistance Committee (PEAC) trainer for teachers, a curriculum validator for the Department of Education curriculum for the gifted, and a textbook writer. She earned her Master in Education major in Curriculum Studies and Bachelor in Secondary Education (Communication Arts-English) from the University of the Philippines-Diliman. She co-authored *A Course Module for Purposive Communication, Building and Enhancing New Literacies Across the Curriculum, A Course Module for Content and Pedagogy for the Mother Tongue*, and *STEAM Series (Language) for Kindergarten*.

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 is 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.rexestore.com
your online book catalog and book store



04-ED-00055-0



WE VALUE YOUR INPUT.

For comments or inquiries, email
The Office of the Chief Operating Officer
at wecare@rex.com.ph
For more info about our products
and services, please visit:
www.rexbookstore.ph



MEMBER

ISBN 978-621-04-0385-5



9 786210 403855