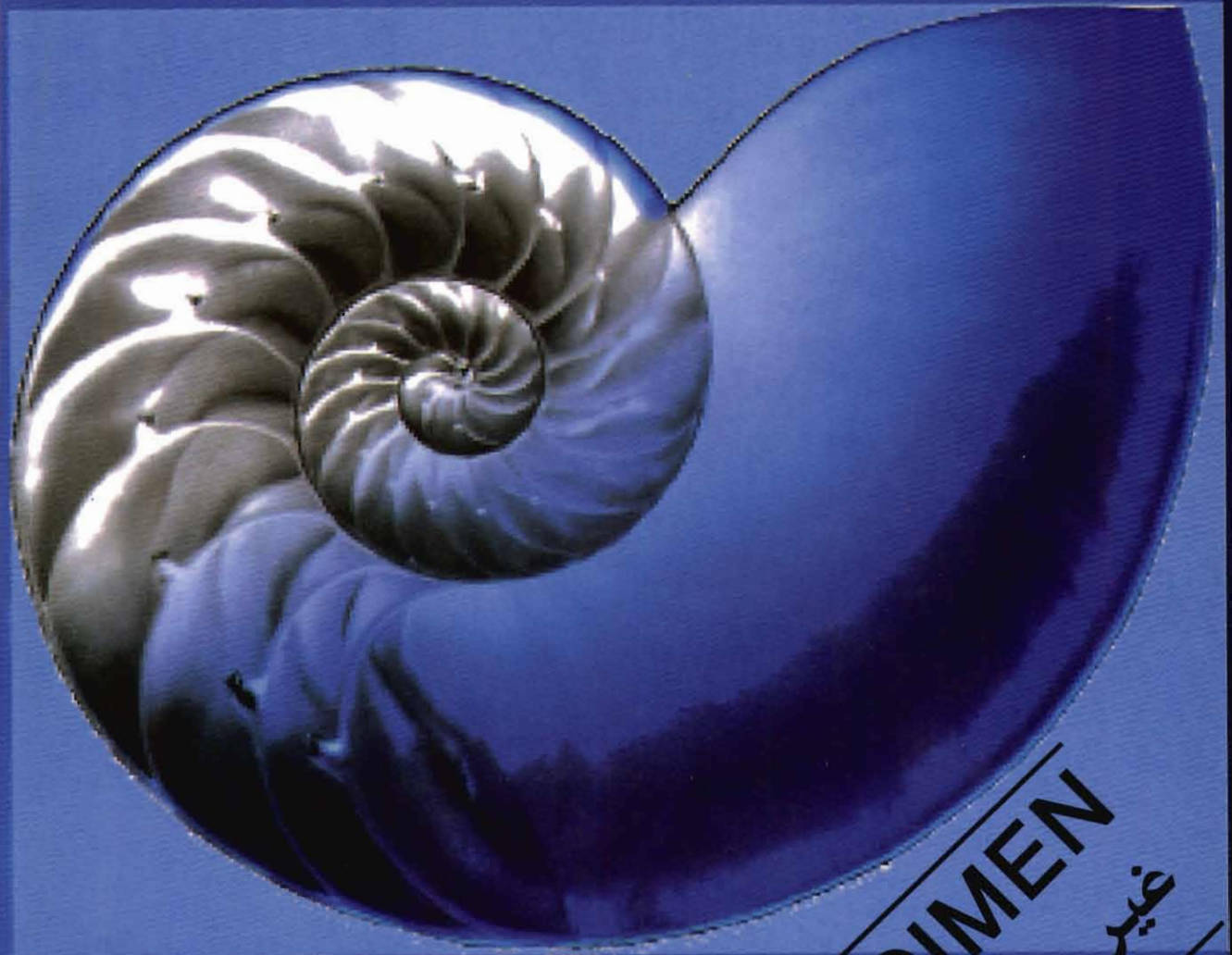


# *Building up* **MATHEMATICS**

Secondary Education  
Third Year  
Life Sciences Section



**SPECIMEN**  
غير مخصص



New Curricula

**Republic of Lebanon**

Ministry of National Education, Youth and Sports

■  
**BUILDING UP  
MATHEMATICS**  
■

**Secondary Education**

Third Year

Life Sciences Section

Center for Educational Research and Development



National



Textbook

**New Curricula**



General Coordinator  
**Victor Melhem**

Proof Reader  
**May Abboud** ■



# **BUILDING UP MATHEMATICS**

**Secondary Education**  
Third Year  
Life Sciences Section

**Toufic Roumi** (Coordinator)  
**Mustapha Jazzar**


*this manual is the Life Sciences version  
of the manuals of the General Sciences program*

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# The National Textbook Project

By issuing the textbooks for the third year of each educational cycle, the Educational Center for Research and Development will have completed the third and last installment of books called for by the New Curricula. We are placing these books in the hands of students with the great hope that we are moving, step by step, toward the goal of acquiring sound learning, using sophisticated educational means and up-to-date methodology that encourage and reinforce individual thinking and research, acquisition of skills, development of ethical and national attitudes, the feeling of national belonging as well as the feeling of belonging to humanity at large.

The on-going revolution in information, communication and educational-aids technology has undoubtedly limited the role of the textbook and lowered the rank it used so recently to occupy. However, in our society and in many other societies, the textbook remains the basic means of education, and it is our duty to exert our utmost effort and care to come up with the best product as to form and content. Yet we should not lose sight of the fact that the textbook is not sufficient by itself but should rather be used as a stepping stone to access other sources of information. What is important is to keep a clear vision and maintain the right course toward our objective. The means should not turn into the end and the student should always remain the focus of the learning/teaching process.

No one ignores or denies the fact that textbook writing requires very high academic and educational qualifications and very wide field experience. The authors committees undeniably possess such qualities. Yet the textbooks of the last two years contained some negative aspects. Such is the nature of human work, no matter how good the intentions or how great the effort extended. Here constructive criticism constitutes a real contribution to raising the standard of authorship, minimizing errors and filling gaps. We say that, with all due appreciation and respect to all those who have contributed to the success of this project.

The Educational Center for Research and Development is embarking this year on a process of evaluating the New Curricula and related textbooks, teacher training courses and student achievement. This is a natural and necessary step now that the new system has been put into effect. This process aims at identifying the curricular objectives that have been achieved as well as those that have not been achieved, with a view to proceeding with the positive aspects and correcting the negative ones.

As part of this correction process, we plan to review the versions that have been issued in order to secure good textbooks for our students, who always deserve the best.

**March 13, 2000**

**President, Educational Center for  
Research and Development**

**Nemer FRAYHA**



This manual aims to emphasize on the importance of mathematics in real life, by showing the utility of this theoretical major considered unfairly unpleasant. To reach this goal we proposed to learners problems related to other fields: Physics, Chemistry, Biology, Demography, Astronomy...

This book is considered and written in accordance with the spirit of the new program.

We find: the scientific content, simplified but rigorous, work to reach the targets, controlled and evaluated and the method adopted, explicitly explained.

Far from being a dry account of facts, this work is a tool that permits and promotes the active participation of learners. We wanted to create an instructive product suitable for an education based on the balanced and well defined division of labor between three parties: The student - the instructor - the administrator.

The instructor is not only the possessor of the knowledge, but is more the animator of the class; he/she guides it in its choice of orientations, maintains its interest, promotes research among its members, and helps find results while indicating their applications.

At the heart of the educative system is the student, a person with the right to an education worthy of a free individual, independent and seeking knowledge. It is the student who, without feeling forced to put up the Knowledge, he/she must learn, must feel constantly faced with situations that stimulate his/her desire to Know more.

- The activities are conceived for the student to review prerequisites, and pushed for asking questions for more information.
- The proofs are often omitted. The objective being to initiate the learner for reasoning and for preparing him/her to approach the exercises easily.
- The exercises meet the pedagogical objectives and acquire Knowledge.

We hope, with this manual, to transfer our open and live conception of mathematics: **interdisciplinary science**.

Finally, any remarks, criticisms, or suggestions that colleagues would like to make will be received with attention.

The Authors

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