

Republic of Lebanon

Ministry of National Education, Youth and Sports

TECHNOLOGY

Basic Education

Grade Nine



Educational Center for Research and Development

General Executive **Assaad Younes**

Translator **Afif Hijazi**

Proof Reader

Kenneth Mortimer

TECHNOLOGY

Basic EducationGrade Nine

Mohamad Debs (Coordinator) Khalil Alameh Abdallah Chikhani

Educational Center for Research and Development Lebanese Educational Publishing Company s.a.l.

■ Documentary Research : Iconographic Team, ECRD

■ Publishing and Distribution: Lebanese Educational Publishing Company s.a.l.

Layout: Technical Team, LEPC s.a.l.

Cover: Elie Tabet Photographs: Tania Jabre

Printing: Typopress

© ECRD 2000, Sin-El-Fil, Lebanon, P.O.Box: 55264

All Rights Reserved for ECRD

First Published 2000

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

TABLE OF CONTENTS

Preface				
 Technology education L'enseignement de la technologie au cycle moyen 				
Introductio	on			
	Card 00	FS	(Functional Specifications) / Application	21
Theme 1	. Food T	ECH	INOLOGY	Tales of the last
	Card 01		Vinegar	35
	Card 02	1.2	Cereals	39
Theme 2.	ELECTRI	CITY		Congress.
	Card 03	2.1	Batteries	45
	Card 04	2.2	Galvanization: Surface treatment*	53
	Card 05	_	The transformer	57
	Card 06	2.4	Electric arc light	63
Theme 3.	ENERGY			
	Card 07	3.1	Windmill: Turbine generator	73
	Card 08	3.2	Hydro-electric plant (generator)	79
	Card 09		Solar heating systems	<i>85</i>
	Card 10	3.4	Solar mirror furnace	91
Theme 4.	ELECTRO	ONIC	S	
	Card 11	4.1	Simple radio receptor	95
	Card 12	4.2	Simple radio receptor with a transistor	101
Theme 5. MECHANICS				
	Card 13	5.1	Pulley blocks	105
	Card 14		Hydraulic press	111
Theme 6.	EVERYDA	AY C	CHEMISTRY	TO PURE
	Card 15	6.1	Soaps	117
	Card 16		Making a mild shampoo	123

^{*} This project is also a part of industrial chemistry.