

Sciences

Grade **4** *For* **Life**
Basic Education

Teacher's Guide



National Center for Educational Research and Development



National
Textbook

New Curricula

Republic of Lebanon

Ministry of Education and Higher Education



SCIENCE FOR LIFE

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Textbook

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... WE BUILD THROUGH EDUCATION

Four years ago, under the leadership of the Minister of National Education, Youth and Sports, the National Center for Educational Research and Development (NCERD) initiated the overall reform of the educational system in Lebanon. Today, NCERD is pleased to present the first collection of textbooks, developed in conformity with the new curricula announced by decree no. 10227, dated the 8th of May, 1997, to all those involved in the education sector.

This collection covers the first year of each of the three basic education cycles, as well as the first year of the secondary cycle. It will be followed, over the next two years, by the textbooks addressed to the remaining two years of each cycle.

The publication of these textbooks follows directly from previous steps undertaken as part of the overall effort to rebuild the educational system. The Plan for Educational Reform, the adoption of a new educational ladder, the new curricula and the new textbooks are all part of a continuous and coherent reform effort. The reform process views the education of the individual learner as a means to develop citizens capable of serving their country and self-confident adults ready to face the challenges of the twenty-first century.

Textbooks play an important role in this ambitious project because they embody the educational and civic objectives of the new curricula. In keeping with the spirit and philosophy of the new curricula, a large number of specialists who had contributed to shaping the new curricula were called upon, from both the private and the public sector, to become members of author committees. The Higher Committee for Planning and the Advisory Committee, which were created by NCERD to oversee the whole reform process, closely monitored the development of the new textbooks. In addition, NCERD sought the assistance of experts from outside Lebanon.

However, we do not claim that the textbook we present to you today is perfect, or that it does not require any revisions whatsoever. Our work is certainly far from complete. After thirty years of stagnation, it was important to act and to do so promptly. We thus considered it appropriate to view this first edition as a starting point and to subject the first collections to the classroom test. A textbook's strengths and weaknesses can really only be identified in the classroom. It is now

up to teachers and students to evaluate these new textbooks. Thanks to their collaboration, we should arrive at concrete proposals for the improvement of subsequent editions.

It should also be pointed out that textbooks have become only one of many available sources for the transfer of knowledge. Indeed, our students are confronted with a constant deluge of information from a variety of media. Consequently, it becomes imperative for students to "learn how to learn" from textbooks, as well as from other sources. This means that we must adopt new work and teaching strategies in order to transform the classroom into an interactive space between a dynamic and enterprising learner and an informed teacher. The teacher's role must lie in assisting the student to acquire knowledge and competencies, to heighten his or her critical sense and to develop teamwork and participatory skills. This is why the educational reform calls for teacher training, the establishment of a structure capable of advising teachers and providing guidance and counseling to students, and the modernization of the exam and evaluation systems to be undertaken alongside the development of new textbooks.

Our attention is now focussed on the next three years. This period will provide an experimental phase, not only for the new textbooks, but also for all the activities that have preceded or accompanied their launch. Thus, the next three years should be viewed as an evaluation phase for the overall educational system of Lebanon.

Finally, I wish to thank sincerely all those who contributed to writing, editing, designing and producing the new textbooks. We hope that our combined efforts to build the future for the children of Lebanon will contribute to the reconstruction of our country.

Beirut, July 22, 1998

President, NCERD
Mounir ABOU-ASSALI

INTRODUCTION

The grade four science curriculum is a combination of three basic components: the science content, the instructional strategies, and the assessment tools. These components blend together to guide the learning-teaching process.

This guide, following the student's textbook, includes five units: Growing Up Healthy, Animals And Their Habitats, Plants And Their Habitats, Matter And Energy, and The Changing Earth. Each unit is divided into chapters and each chapter is divided into activities (lessons). The details for each activity include: title of the activity, objectives, background information, recommendations, additional activities, answers to in-text questions, and answers to exercises.

Pedagogical Recommendations:

For a proper use of the Science for Life textbook, the Teacher's Guide must be utilized and the following recommendations should be considered by the teacher.

- The new national curriculum follows a pedagogical approach that considers the students as an active element in the teaching-learning process through both individual and cooperative group work. This pedagogical approach is based on the active involvement of the student in solving problems, doing experiments, making models, studying specimens, exploiting documents (pictures, drawings, text, etc.), participating in field trips, doing research, and making decisions.
- The individual differences among the students should be addressed in order to ensure the active participation of every student.
- Educational support material such as audio-visuals, laboratory equipment and material, library resources, etc. must be used along with the textbook.
- The use of instruments, models, and some materials needs to be demonstrated by the teacher before the actual work of the students.
- Teachers are advised to do unit planning since some of the activities require advance preparation a few days prior to the scheduled date of the activities.
- Photocopying of some pages from the textbook is a must whenever the task requires students to cut things out. (Example: p. 21).

The general educational philosophy of the new curricula necessitates the assessment of students on an ongoing basis through all class activities. The different activities are based on a set of performance objectives which guide the assessment process through the mastery of science process skills.

Chart of Skills

- Observes and makes inferences about different objects, phenomena and living things in his environment.
- Communicates ideas in oral, written and symbolic forms.
- Distinguishes between living and non-living things in his environment.
- Classifies scientifically some plants and some animals.
- Carries out experiments about the properties of sound, different types of soil, and measurement of mass; in addition to constructing models about the balance and the arm.
- Poses problems and finds solutions and explanations to these problems.
- Practices the proper behaviors relating to his health and his environment.
- Develops self confidence, sense of beauty, cooperation and positive interaction with others.

Assesment depends on matching the skills mastered by the student against the skills mentioned in the Chart of Skills.

We hope that Science for Life will help develop scientifically literate students who are able to make sound decisions, adopt positive attitudes, and practice proper behaviors and skills which help them cope with the ever-changing world.

The Authors

Cooperative Learning:

Many of the activities at this level, as indicated in the curriculum objectives, follow a cooperative learning approach. Cooperative learning refers to a set of teaching methods in which students work in small groups to achieve a common goal. The students in each group are responsible and accountable not only for their own learning but also for helping other students in the same group learn.

Following this approach will help students establish mutual trust and acceptance as well as develop communication and social skills which they need as responsible citizens operating in a pluralistic society. When applied properly, cooperative learning motivates students and involves them actively in the learning-teaching process.

Common Students Roles:

- Leader or coordinator
- reporter
- evaluator
- reader
- recorder
- material handler
- timekeeper

Steps to Follow When Organizing a Cooperative Learning Activity:

- Decide upon the assigned task.
- Explain the task to the students.
- Set criteria for evaluation.
- Divide the students into groups.
- Assign a role to each group member.
- Determine the social skill that will be practiced by students during the activity.
- Allow for a debriefing time during which the groups present and share their findings.
- Assess the students individually and/or in groups.

Point to consider:

When using a cooperative learning approach:

- The classroom environment needs to be reorganized in a way that allows for maximum interaction among the members of the same group.
 - The role of the teacher becomes a facilitator for learning rather than the knowledge giver.
 - The students become active learners rather than recipients of knowledge; and competition is accompanied by collaboration.
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