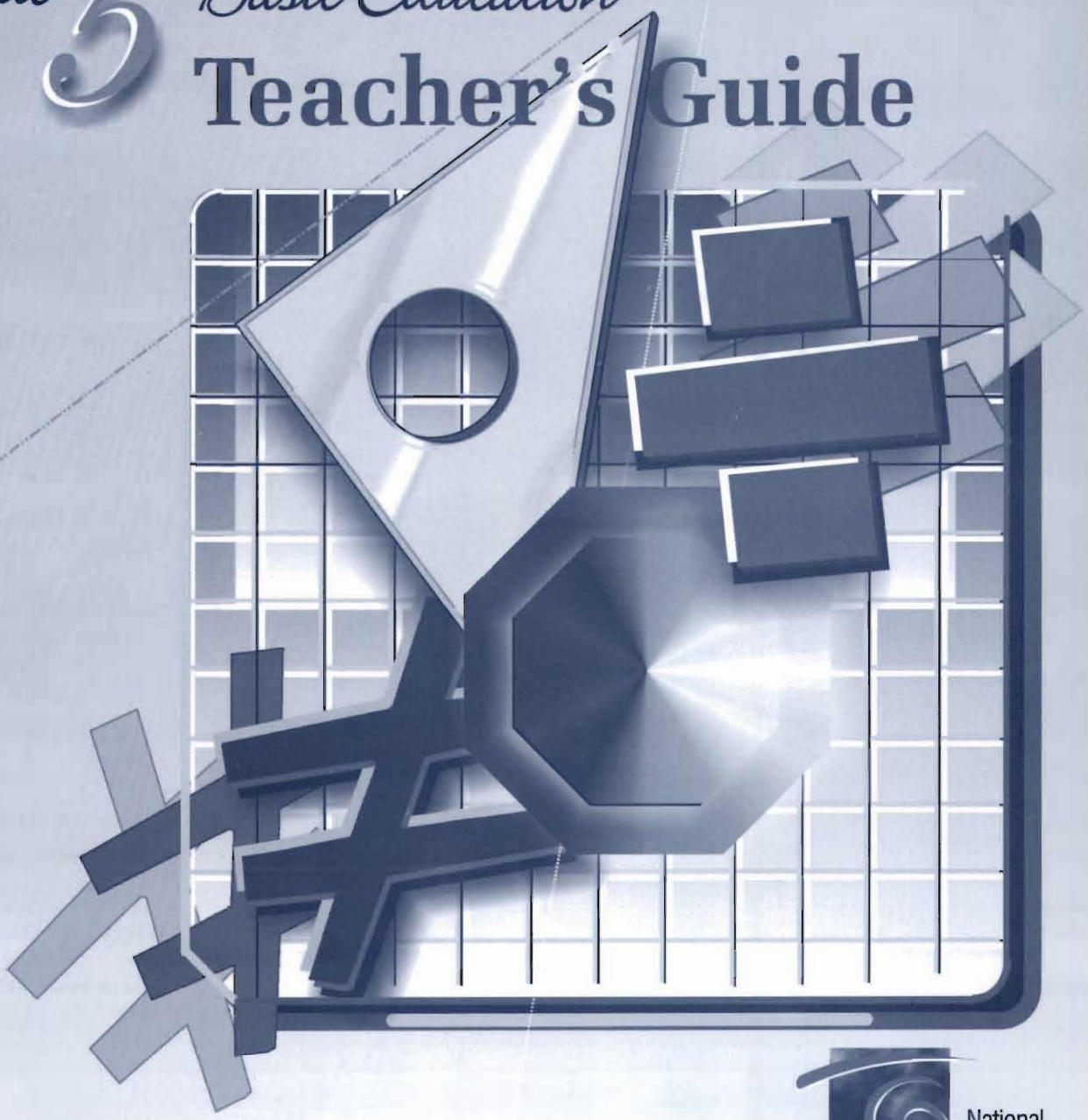
Building UP Mathematics

Grade 5 Basic Education

Teacher's Guide



National Center for Educational Research and Development

National Textbook

New Curricula

Republic of Lebanon

Ministry of National Education, Youth and Sports

BUILDING UP MATHEMATICS

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General Coordinator
Victor Melhem

Translator
Amal Tannous

Pedagogical Reader
Hatem Chalak

Language Reader
Roula Abou Daher

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Habib Abi Nader (Coordinator)
Maurice Charbel
Wafaa Chohayeb
Nada Moubarak Feghali
Mirna Melhem

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The National Textbook Project

This is the second installment of textbooks completed by the Center as part of a three-stage effort to produce the 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 and modern learning, using sophisticated educational means and up-to-date methodology that encourage and reinforce individual thinking and research, the acquisition of skills, the 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 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 qualifications and qualities, yet last year's textbooks did contain some faults and gaps which were duly pointed out by researchers in many articles, and, indeed, we have benefited from some of them. Such is the nature of human work, no matter how good the intentions or how great the effort exerted.

Constructive criticism is a real contribution to raising the standard of authorship, minimizing errors and filling gaps. We only hope that criticism will always be objective and motivated by a desire to enhance educational reform in order to achieve better products.

A favorite adage handed down from our old scholars: "He who criticizes you is as helpful as a co-author". Let all criticism directed at the Center be of this caliber.

In closing, we hope that we all will have benefited from our experience and that the textbooks of the third and final stage be closer to realizing our hopes and more beneficial to our students. We are now preparing ourselves to assess the parts so far achieved of the new curricula and to assure that our educational movement is proceeding on the right track for achieving the best results.

June 2, 1999

President, National Center for Educational Research and Development

Nemer FRAYHA

Preface

The textbook that corresponds to this *Teacher's Guide* is designed according to the new curriculum. This curriculum is based on results of pedagogical research and on principles of epistemology, as much genetically as mathematically, and requires appropriate methodology based on the action and autonomy of the student.

- Under this methodology, mathematics is treated through a measurable continuous and unlimited action. This action lies in the actual environment of the child where the utilitarian aspects of mathematics are often revealed. Thus, the student faces real-life problems and has to guess, try, and verify solutions, gradually devising approaches that will allow him to construct his own models later on.

- On the other hand, the independence and individuality of the child is the major concern that directs all activities and methods of the textbook. This textbook is concerned with developing the student's forms of expression and communication skills.

In hopes of attaining the goals of the programs, it is recommended that the users, teachers, parents, and students observe the following:

1) The structural layout of the book and the order of the chapters;

2) The methodological structure of each chapter (refer to *How to Use the Textbook*);

3) The suggestions offered in the *Pedagogical Guide.*

All comments, questions, and suggestions are welcomed and will be treated with great attention.

The authors

ARITHMETIC AND ALGEBRA (100 h)

1- Natural numbers (20 h)

1.1 Criteria of divisibility by 3, 4, and 9
1.2 Common multiples of two natural numbers
1.3 Divisors of a natural number
1.4 Common divisors of two natural numbers
1.5 Decimal numeration system

2- Fractions (10 h)

2.1 Equality and simplification of fractions
2.2 Mixed numbers

3- Decimals (10 h)

Comparison and representation of decimal numbers

4- Addition (15 h)

4.1 Addition of fractions
4.2 Addition of decimals with several decimal places

5- Subtraction (15 h)

5.1 Subtraction of fractions
5.2 Subtraction of decimals with several decimal places

6- Multiplication (20 h)

6.1 Multiplication of decimals
6.2 Function: *Multiply by* $\frac{a}{b}$
6.3 Product of a duration by a natural number

7- Division (10 h)

Decimal quotient of a division

GEOMETRY (25 h)

1- Location and reference (3 h)

Distance of two parallel lines

2- Solids (7 h)

Development of solids

3- Plane figures (10 h)

3.1 Angles

3.2 Diagonals of a polygon

3.3 Classification of quadrilaterals according to the diagonals

3.4 Diameter of a circle

4- Transformation (5 h)

Dilation

MEASURE (20 h)

1- Length (3 h)

Length (circumference) of a circle

2- Area (10 h)

Area of a square, rectangle, right triangle, and disc

3- Angle (2 h)

Measure of an angle in degrees

4- Capacity (5 h)

Metric units of capacity

Statistics (5 h)

1- Handling data (5 h)

Representing data in dotted line graphs, bar graphs, and pictographs

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