

LITERACY TRAINING

ARITHMETIC

DEFINITION OF THE DOMAIN FOR SUMMATIVE EVALUATION

STEP 2

DECEMBER 1998

LITERACY TRAINING

ARITHMETIC

DEFINITION OF THE DOMAIN FOR SUMMATIVE EVALUATION

STEP 2

DECEMBER 1998

© Gouvernement du Québec
Ministère de l'Éducation, 1999 — 99-0412

ISBN 2 - 550 - 34721-8

Legal Deposit — Bibliothèque nationale du Québec, 1999

TABLE OF CONTENTS

1	Introduction	1
2	Program Orientations and Their Consequences for Summative Evaluation	2
3	Content and Skills Covered in the Program for Purposes of Summative Evaluation	3
3.1	Content	3
3.2	Skills	3
4	Table of Dimensions	4
5	Observable Behaviours	5
6	Justification of Content, Skills and Their Weighting	7
7	Description of the Examination	8
7.1	Type of Examination	8
7.2	Duration	8
7.3	Materials	8
7.4	Pass Mark	8
8	Bibliography	9

1 INTRODUCTION

This definition of the domain for summative evaluation describes and classifies the essential and representative elements of the *Guide to Customized Literacy Training*, specifically, for the section on *Arithmetic*. It presents an overview of the program, but should by no means replace the program itself. The purpose of defining the domain is to ensure that the summative evaluation instrument is consistent with the overall program.

The definition of the domain for summative evaluation is used to prepare examinations that are valid from one version to another, from one year to another, and from one school board to another, taking into account the responsibilities shared by the ministère de l'Éducation and the school boards.

2 PROGRAM ORIENTATIONS AND THEIR CONSEQUENCES FOR SUMMATIVE EVALUATION

Orientations

In the program, learning opportunities are created out of everyday situations to help adults become autonomous.

Students learn about the concept of a fraction by means of themes or concrete situations designed to help them acquire knowledge and skills.

The program is intended to help students develop a better understanding of the concepts related to the four arithmetic operations by applying their acquired knowledge and skills in everyday situations.

In the program, students must solve problems they may encounter in everyday life.

Using concrete situations, the program enables students to learn concepts by means of drawings, symbols and mathematical expressions.

Consequences

Summative evaluation items will test the students' ability to act autonomously in everyday situations.

Summative evaluation items will measure the students' arithmetic knowledge and skills, but only with respect to fractions. Evaluation tasks must be related to themes or concrete situations.

Summative evaluation items will measure the students' knowledge and their ability to use the four arithmetic operations in everyday situations.

Evaluation tasks will involve solving number-related problems that students may encounter in everyday life.

Students will be evaluated on their ability to work with drawings, symbols and mathematical expressions.

3 CONTENT AND SKILLS COVERED IN THE PROGRAM FOR PURPOSES OF SUMMATIVE EVALUATION

3.1 **Content**

Numbers

- Fractions
- The four basic operations
- The four basic operations with money
- Problem solving

3.2 **Skills**

Structuring

Students will be familiar with basic mathematical concepts.

Performing Operations

Students will be able to perform operations in a given situation.

Synthesizing

Students will be able to apply their mathematical knowledge and use it to solve problems related to everyday situations.

4 TABLE OF DIMENSIONS

<p style="text-align: center;">CONTENT</p> <p>SKILLS</p>	<p style="text-align: center;">NUMBERS</p>
<p style="text-align: center;">STRUCTURING 20%</p>	<p>Fractions: basic concepts The four operations - Basic concepts - Symbols and vocabulary</p> <p style="text-align: right;">(1) 20%</p>
<p style="text-align: center;">PERFORMING OPERATIONS 50%</p>	<p>The four operations - Addition (with and without carry-over) - Subtraction (with and without borrowing) - Multiplication - Division</p> <p>The four operations with money</p> <p style="text-align: right;">(2) 50%</p>
<p style="text-align: center;">SYNTHESIZING 30%</p>	<p>Solving problems involving the four basic operations</p> <p style="text-align: right;">(3) 30%</p>

5 OBSERVABLE BEHAVIOURS

Relative value of the items

↓ Box numbers in the table of dimensions

↓

- | | | |
|-----|-----|--|
| 1% | (1) | Students will be able to recognize fractions shown in two drawings, one illustrating a fraction representing part of a whole and the other illustrating a fraction representing part of a group of similar objects. (2.01) ¹ |
| 5% | | Given five fractions or mixed numbers written as words, students will be able to write them as numerals. (2.02) |
| 2% | | Students will be able to recognize the symbol for each of the four basic operations (+, −, ×, ÷) and to match each symbol with the word designating the corresponding operation. (2.25-2.26-2.41-2.42) |
| 6% | | Given a text about four sentences long and containing four words related to addition and subtraction, students will be able to classify these words according to the operation they describe. (2.27-2.28) |
| 6% | | Students will be able to correctly insert three words relating to multiplication and division into three short texts. (2.43-2.44) |
| 12% | (2) | Students will be able to do three additions without carrying over (two involving two-digit numbers and one involving three-digit numbers) and three subtractions without borrowing (two involving two-digit numbers and one involving three digit numbers). These six operations will be presented vertically. (2.29-2.30) |
| 8% | | Students will be able to add and subtract sums of money involving numbers with at least two digits:
- two additions using carry-over; (2.31-2.33)
- two subtractions using borrowing.
These operations will be presented horizontally. (2.32-2.34) |

1. The numbers written in parentheses after each behaviour are the corresponding objectives in the *Guide to Customized Literacy Training, Book 3, Arithmetic*.

- 12% Students will be able to do three multiplications and three divisions:
- two multiplications involving a one-digit multiplier; (2.45)
 - one multiplication involving a two-digit multiplier; (2.47)
 - two divisions involving a one-digit divisor; (2.46)
 - one division involving a two-digit divisor. (2.48)
- 18% Students will be able to do three multiplications and three divisions involving sums of money. (2.49-2.50)
- 30% (3) Students will be able to solve the following types of problems related to everyday situations:
- a problem involving one addition;
 - a problem involving one subtraction;
 - a problem involving one addition and one subtraction; (2.37)
 - a problem involving one multiplication;
 - a problem involving one division;
 - a problem involving one multiplication and one division. (2.58)
- The six problems should involve numbers with at least two digits.

6 JUSTIFICATION OF CONTENT, SKILLS AND THEIR WEIGHTING

Since the program focuses on helping students to become autonomous and to use their acquired knowledge and skills in everyday situations, most of the objectives regarded as prerequisites (P) in Step 2 have been taken into account in the definition of the domain for summative evaluation.

However, the objectives pertaining to the use of a calculator have not been taken into account, because this aspect is difficult to assess using a summative evaluation instrument. It is assumed that these skills will have been assessed by means of formative evaluation.

Since all the prerequisites (P) in Step 2 of the program are related to numbers, the entire examination will focus on numbers.

In Step 2, it is essential that students know and understand the basic mathematical concepts related to numbers. However, summative evaluation will also be used to ensure that students are able to perform operations and apply their acquired knowledge to solve problems related to everyday situations. Note that the ability to mathematize will not be assessed in Step 2, since no objective in this step relates to this skill.

As a result, the skills have been weighted as follows:

- | | |
|-------------------------|-----|
| - Structuring | 20% |
| - Performing operations | 50% |
| - Synthesizing | 30% |

7 DESCRIPTION OF THE EXAMINATION

7.1 **Type of Examination**

Each student will take a written examination for purposes of summative evaluation.

7.2 **Duration**

The examination is written in a single session lasting no more than 90 minutes.

7.3 **Materials**

Students **ARE NOT PERMITTED** to use a calculator or any other materials.

7.4 **Pass Mark**

To successfully complete Step 2, students must obtain 60 out of 100 on this examination.

8 BIBLIOGRAPHY

Québec. Ministère de l'Éducation. Direction de la formation générale des adultes. Service de l'alphabétisation. *A Guide to Customized Literacy Training, Book 1*, Third Edition (Code 38-2943-02A). Québec: Ministère de l'Éducation, May 1997.

Québec. Ministère de l'Éducation. Direction de la formation générale des adultes. Service de l'alphabétisation. *A Guide to Customized Literacy Training, Book 3, Arithmetic*, Third Edition (Code 38-2943-04A). Québec: Ministère de l'Éducation, September 1998.

