LITERACY TRAINING

ARITHMETIC

DEFINITION OF THE DOMAIN FOR SUMMATIVE EVALUATION

STEP 4

DECEMBER 1998

Québec ⚜

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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	**Consequences**
In the program, learning opportunities are created out of everyday situations to help adults become autonomous.	Summative evaluation items will test the students' ability to act autonomously in everyday situations.
Students learn about the concepts of percentage and the rule of three and begin studying geometry by means of themes or concrete situations designed to help them acquire knowledge and skills.	Summative evaluation items will measure the students' knowledge and skills with respect to percentages, the rule of three and geometry. Evaluation tasks must be related to themes or concrete situations.
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.	Summative evaluation items will measure the students' knowledge and their ability to use the four arithmetic operations in everyday situations.
In the program, students must solve problems they may encounter in everyday life.	At the end of the literacy program, evaluation tasks will involve solving number-related problems that students may encounter in everyday life.
Using concrete situations, the program enables students to learn concepts by means of drawings, symbols and mathematical expressions.	Summative evaluation items will assess the students' ability to work with drawings, symbols and mathematical expressions related to concrete situations.

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

    3.1   **Content**

        Numbers
        - Percentage
        - Rule of three

        Geometry
        - Geometric figures: circle, square, rectangle, triangle
        - Measurement of straight lines
        - Measurement of angles
        - Symbols and vocabulary: perimeter; area; volume of a square, rectangle and triangle
        - Scale of a map or plan

    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

CONTENT SKILLS	NUMBERS 60%	GEOMETRY 40%
STRUCTURING 20%	- Percentage - Rule of three (1) 10%	- Geometric figures: circle, square, rectangle, triangle - Symbols and vocabulary: geometry, perimeter, area, volume of a square, rectangle and triangle - Scale of a map or plan (4) 10%
PERFORMING OPERATIONS 40%	- Percentage - Rule of three (2) 10%	- Measurement of straight lines - Measurement of angles - Perimeter, area, volume - Scale of a map or plan (5) 30%
SYNTHESIZING 40%	- Percentage - Rule of three (3) 40%	

5   OBSERVABLE BEHAVIOURS

Relative value of the items
↓   Box numbers in the table of dimensions
          ↓

Numbers

1%   (1)   Given ten mathematical symbols, students will be able to identify the percent sign. (4.01)[1]

2%   Given four definitions, students will be able to recognize the definition of percentage. (4.02)

3%   In a text approximately six sentences long, students will be able to pick out three words related to the concept of percentage. (4.03)

4%   Given two examples, students will be able to recognize the three main elements of the rule of three. (4.07)

5%   (2)   Students will be able to calculate the percentages of five given numbers (i.e., two two-digit numbers, two three-digit numbers and one four-digit number). (4.04)

5%   Given three examples, students will be able to choose the one that involves using the rule of three and to then apply that rule. (4.08)

        (3)   Given four problems related to everyday situations, students will be able to calculate percentages:
10%   - two problems involving the four basic operations;
10%   - two problems involving decimals representing sums of money. (4.06)

20%   Given four problems related to everyday situations, students will be able to apply the simple rule of three. (4.10)

Geometry

2%   (4)   In examining a drawing of a scene from everyday life, students will be able to recognize a circle, a square, a rectangle and a triangle. (4.11)

6%   Given eight words related to geometry, perimeter, area or volume, students will be able to match six of these words with their corresponding symbols. (4.13-4.18-4.20-4.27)

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

2%   Given a map or plan, students will be able to recognize a symbol associated with scale drawings and to determine the scale used. (4.30)

2%   (5)   Given a drawing of a square and a rectangle, students will be able to use a ruler to measure four straight lines. (4.12)

8%   Students will be able to use a protractor to measure and construct $30°$, $45°$, $60°$ or $90°$ angles. (4.14-4.15-4.16)

12%   Students will be able to calculate the following in centimetres:
- the perimeter of a square, rectangle and triangle; (4.19)
- the area of the same square, rectangle and triangle. (4.21)

2%   Students will be able to calculate the volume of a three-dimensional rectangular box whose measurements are given in centimetres. (4.28)

3%   Given a scale drawing, students will be able to find the actual distance between two points. (4.31)

3%   Conversely, students will be able to do a scale drawing given the actual dimensions of various elements. (4.32)

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 4 have been taken into account in the definition of the domain for summative evaluation.

Problem solving may require knowledge and skills acquired in the three previous steps (e.g., the four arithmetic operations, percentages and decimals for problems involving money).

Even though many objectives in Step 4 of the program are related to **geometry**, more emphasis has been placed on the objectives pertaining to **numbers** because it takes longer and requires more work to cover the prerequisites related to **numbers** and because students will use them more often than **geometry** in everyday life.

Note that the ability to mathematize will not be assessed in Step 4, since no objective in this step relates to this skill.

As a result, the content has been weighted as follows:

- Numbers   60%
- Geometry   40%

In Step 4, it is important that students know the basic mathematical concepts related to **numbers** and **geometry**. However, summative evaluation will instead be used to ensure that students are able to perform operations and apply their acquired knowledge to solve problems related to everyday situations.

The skills have therefore been weighted as follows:

- Structuring   20%
- Performing operations   40%
- Synthesizing   40%

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 must have a metric ruler and a protractor.

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

7.4   Pass Mark

To successfully complete Step 4, students must obtain 60 out of 100 on this examination.

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