

**SCALES
OF COMPETENCY LEVELS**

SECONDARY SCHOOL EDUCATION
CYCLE TWO

Mathematics

Third Edition
Secondary III, IV and V

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Table of contents

FOREWORD	4
PART I: INTRODUCTION	5
PART II: THE SCALES FOR MATHEMATICS	9
Secondary III, IV and V	
Competency 1: Solves a situational problem	10
Competency 2: Uses mathematical reasoning	12
Competency 3: Communicates by using mathematical language	14

Foreword

The scales of competency levels presented in this document constitute the official reference points that form the basis of the student competency reports that teachers must prepare in Secondary Cycle Two. Part I of this document is intended to provide additional information on the nature of these instruments and how they are meant to be used. The scales for each subject are then presented in Part II.

It should be noted that this third edition contains the scales for Secondary III, IV and V, and replaces the earlier editions, published in 2007 and 2008, of the scales of competency levels for Secondary Cycle Two.

Part I: Introduction

Introduction

An Official Tool for All Teachers

The scales of competency levels were designed to enable teachers to determine the competency levels attained by students at the end of each year in Secondary Cycle Two, and their use is prescribed by the *Basic school regulation* (section 30.1).

A Uniform Model for All Subjects

To ensure that the scales for all subjects have the same format, a model composed of five competency levels was selected. Table 1 outlines the general model that served as the basis for defining the competency levels for all the subjects, at both the elementary and secondary levels.

Outline of the scales of competency levels

LEVEL	COMPREHENSIVE ASSESSMENT	MOBILIZATION OF RESOURCES*
5	ADVANCED	The student effectively mobilizes the full range of resources: he/she performs the tasks in a remarkable manner.
4	THOROUGH	The student mobilizes the full range of resources: he/she performs the tasks correctly.
3	ACCEPTABLE	The student mobilizes the main resources: he/she performs the basic tasks.
2	PARTIAL	The student mobilizes some of the resources, with guidance: he/she has trouble performing the tasks.
1	MINIMAL	The student mobilizes few resources: he/she partially performs the tasks or performs them with constant help.

* Resources: the *Program Content* section of each subject-specific program “describes the learning essential for the development and exercise of the competency. . . . It includes learning related to concepts, methods, strategies, processes, techniques and attitudes.” (See *Québec Education Program, Secondary Cycle Two*, chapter 4, p. 28.)

The description of each competency level is consistent with the content of the Québec Education Program, but is not a literal reiteration of that content. It is not a matter of defining learning objectives, but of proposing reference points that can be used as a guide in making an assessment with respect to the student’s level of competency development at the end of each year of Secondary Cycle Two.

In general, each level describes concrete achievements that are typical for the students who have attained them. When viewed in its entirety, each description implies that some choices had to be made so that only certain aspects, typical of that competency level, were retained. The purpose of this description is to provide a succinct picture of the competency level, not to propose an exhaustive list of the elements to be verified. The competency level descriptions appear in the form of structured paragraphs and these profiles pertain as much to the processes or procedures adopted by the student as they do to the results he or she finally achieves.

It should be noted that the levels progressively subsume each other. In other words, an aspect of a competency deemed to have been acquired at a given competency level is presumed to have been acquired at the superior levels.



The Distinctive Feature of Level 1

The wide range of observable behaviours possible for a competency exhibiting minimal development makes it difficult to draw up a typical profile for level 1. In fact, competency level 1 is attributed to students who have not attained level 2. Thus the description of level 1 is often brief and usually mentions that the student needs ongoing support to successfully carry out the tasks assigned to him or her.

Cross-Curricular Competencies

The descriptions contained in the scales for the various subjects take the cross-curricular competencies into account, since their development is closely linked to that of the subject-specific competencies. The presence of elements associated with cross-curricular competencies, particularly at the higher levels of the scales for each subject, indicates their importance for students' educational success and highlights the fact that they must be specifically targeted by planned learning and evaluation situations.

Particular Features of the Scales for Secondary Cycle Two

While the scales of competency levels for Secondary Cycle Two are an extension of those for Secondary Cycle One, they have their own particular features, since a competency report must be prepared at the end of each year. In this context, under the heading *Development of the Competency*, the Québec Education Program provides guidelines for planning the learning and evaluation to be carried out each year, for each competency. The introduction to each scale restates elements of these guidelines, highlighting those that have an impact on the preparation of the competency report.

Use of the Scales

The competency report is not the result of some mathematical calculation made on the basis of results recorded during the cycle; it is, rather, an assessment of the level of competency a student has attained, that is, of the student's ability to effectively draw on and use the resources specified in the Québec Education Program (concepts, methods, strategies, processes, techniques, attitudes). Analysis of the observations made makes it possible to obtain a portrait of the student's competency development and to match it with one of the levels on the scale. Keep in mind that this is a global assessment and that the scales are not designed for analytical use. Teachers should not, therefore, carry out a point-by-point comparison of the statements for a given level with the recorded data.

Since the descriptions contained in the scales are relatively short, they cannot specify all the aspects that must be taken into account in making an assessment of competency development. Different evaluation tools (e.g. rubrics, checklists) are therefore needed to gather more specific, complete information in order to give students feedback during the learning process and to provide a foundation for teachers' assessments. Since these are based on relevant and sufficient records attesting to the levels attained, it is important that teachers keep such records so that they can refer to them as needed.

It is therefore important that students who are at risk of not progressing beyond the lower levels of the scale (1 and 2) be identified as early as possible, and given appropriate support. A pedagogical diagnosis and proposals for support measures could be provided along with the competency report in such a case (for example, within an individualized education plan).

In the interests of greater transparency, teachers are encouraged to familiarize the students and their parents with the scales, to ensure that they understand the competency level descriptions and the manner in which they will be used.

MAIN PRACTICES TO BE ESTABLISHED FOR PREPARING COMPETENCY REPORTS

- Provide the students with frequent and varied opportunities to demonstrate their competencies.
- Explain the scales and their purpose to students and parents.
- Keep relevant and sufficient records of student learning.
- Make a general association between a student's competency and one of the levels on the scale, without carrying out a point-by-point comparison between the observations made and each of the statements for a level.
- Where called for, report more detailed information for certain students (e.g. those with an individualized education plan).

Part II: The Scales

Mathematics

MATHEMATICS

Competency 1: Solves a situational problem

At the end of each year of Secondary Cycle Two, the teacher must prepare competency reports by determining the competency levels attained by the students. Throughout the cycle, the teacher presents students with a variety of situational problems that enable them to demonstrate their competency in solving a situational problem, in accordance with the requirements of the Québec Education Program.

Because the same scales apply to the three options as well as to the three years in Cycle Two, it is important that teachers propose situations that respect the parameters described under the heading *Development of the Competency*. These parameters serve to develop, adapt or modify learning and evaluation situations or to adjust their complexity, and are associated with the students' awareness of the ways in which they approach their work, with the contexts and the conditions under which the work is carried out and with the resources required. This section describes the spirit that characterizes each option and gives a synopsis of the elements of the learning content that could be incorporated into the situational problems assigned.

Note:

In accordance with the evaluation criteria set out in the Québec Education Program for the competency *Solves a situational problem*, the scales refer to the validation of the steps in a solution. However, as specified in the Mathematics program (p. 21), the work involved in validating the solution may not always be shown.

Solves a situational problem

5

Advanced competency development

Identifies all the relevant information and takes into account all the constraints. Determines all the steps involved and uses efficient strategies (effective and time-saving). Uses the required mathematical concepts and processes and produces a correct solution or one that contains minor errors (e.g. miscalculations, inaccuracies, omissions). Validates his/her solution and rectifies it, if necessary. Presents a complete and structured solution. Observes the rules and conventions of mathematical language. When required to account for his/her solution, explains or justifies the steps in his/her solution.

4

Thorough competency development

Identifies most of the relevant information and takes into account most of the constraints. Determines most of the steps involved and uses effective strategies. Uses most of the required mathematical concepts and processes and produces a solution containing few errors related to these. Validates the main steps in his/her solution and rectifies it, if necessary. Presents a structured solution even though some of the steps are implicit. Observes the rules and conventions of mathematical language despite some minor errors or inaccuracies. When required to account for his/her solution, explains and justifies the main steps in his/her solution.

3

Acceptable competency development

Identifies some relevant information and takes into account some constraints. Determines some of the steps involved and uses strategies that are not very effective. Uses some of the required mathematical concepts and processes and produces a solution containing some errors related to these. Validates some of the steps in his/her solution. Presents a solution that is not very organized or with several steps that are either implicit or not shown. Makes some errors related to the rules and conventions of mathematical language. When required to account for his/her solution, explains some of the steps in his/her solution.

2

Partial competency development

Identifies little relevant information and takes into account few of the constraints. Determines the simplest steps involved and uses strategies that are not very appropriate. Uses few of the required mathematical concepts and processes and produces a partial solution containing several errors related to these. Does not very often call his/her results into question. Presents a solution consisting of isolated elements. Makes several errors related to the rules and conventions of mathematical language. When required to account for his/her solution, explains and justifies the simplest steps in his/her solution.

1

Minimal competency development

Identifies some of the information given in a situational problem without distinguishing between relevant and irrelevant information, and takes no more than one of the constraints into account. Uses inappropriate strategies. Uses mathematical concepts and processes that are not very appropriate and produces an inappropriate solution or no solution at all. Shows his/her work if given a model or a procedure to follow. Shows little or no concern for the rules and conventions of mathematical language. When required to account for his/her solution, explains some of the simplest steps of the given model or procedure.

MATHEMATICS

Competency 2: Uses mathematical reasoning

At the end of each year of Secondary Cycle Two, the teacher must prepare competency reports by determining the competency levels attained by the students. Throughout the cycle, the teacher presents students with a variety of situations that enable them to demonstrate their competency in using mathematical reasoning, in accordance with the requirements of the Québec Education Program. The development of this competency in Secondary Cycle Two is based on what students learned in Secondary Cycle One. Students are expected to use more refined reasoning and to construct more complex and extensive networks of concepts and processes.

Because the same scales apply to the three options as well as to the three years in Cycle Two, it is important that teachers propose situations that respect the parameters presented under the heading *Development of the Competency*. These parameters serve to develop, adapt or modify learning and evaluation situations or to adjust their complexity, and are associated with the students' awareness of the ways in which they approach their work, with the contexts and the conditions under which the work is carried out and with the resources required. This section describes the spirit that characterizes each option and gives a synopsis of the elements of the learning content that could be incorporated into the situations assigned.

Uses mathematical reasoning

5

Advanced competency development

Takes all aspects of the situation into account and uses efficient strategies (effective and time-saving) in applying his/her mathematical reasoning. Uses mathematical concepts and processes that enable him/her to meet the requirements of the situation efficiently. Applies the required mathematical concepts and processes appropriately. Presents a complete and organized procedure that explicitly outlines what was done. Rigorously observes the rules and conventions of mathematical language. Rigorously uses appropriate arguments when required to justify or support his/her statements, conclusions or results. Formulates one or more appropriate conjectures that account for every aspect of the situation.

4

Thorough competency development

Takes most aspects of the situation into account and uses effective strategies in applying his/her mathematical reasoning. Uses appropriate mathematical concepts and processes that enable him/her to meet the requirements of the situation. Applies the required mathematical concepts and processes appropriately, but makes minor errors (e.g. miscalculations, inaccuracies, omissions). Presents a complete and organized procedure that explicitly outlines what was done, even though some of the steps are implicit. Observes the rules and conventions of mathematical language despite some minor errors or inaccuracies. Uses correct arguments when required to justify or support his/her statements, conclusions or results. Formulates one or more appropriate conjectures that account for most of the important aspects of the situation.

3

Acceptable competency development

Takes some aspects of the situation into account and uses strategies that are not very effective in trying to apply his/her mathematical reasoning. Uses some appropriate mathematical concepts and processes that enable him/her to meet the requirements of the situation. Applies the required mathematical concepts and processes, but makes some errors. Presents a procedure that is poorly organized or is unclear, making it difficult to see what he/she has done. Makes some errors related to the rules and conventions of mathematical language. Uses some appropriate or basic arguments when required to justify or support his/her statements, conclusions or results. Formulates one or more partially appropriate conjectures that account for certain aspects of the situation.

2

Partial competency development

Takes few aspects of the situation into account and uses strategies that are not very appropriate in trying to apply his/her mathematical reasoning. Uses few appropriate mathematical concepts and processes that enable him/her to meet the requirements of the situation. Applies the required mathematical concepts and processes, but makes several errors. Presents a procedure consisting of isolated elements, showing little work that explicitly outlines what was done. Makes several errors related to the rules and conventions of mathematical language. Uses arguments that are not very appropriate when required to justify or support his/her statements, conclusions or results. Formulates one or more conjectures that are not very appropriate and that take few aspects of the situation into account.

1

Minimal competency development

Takes into account aspects that are not relevant to the situation and uses inappropriate strategies in trying to apply his/her mathematical reasoning. Uses mathematical concepts and processes that are not appropriate to the situation. Applies the chosen mathematical concepts and processes, but makes several conceptual or procedural errors. Presents a procedure that is completely unrelated to the situation or does not show any procedure. Shows little or no concern for the rules and conventions of mathematical language. Uses incorrect arguments or arguments unrelated to the situation when required to justify or support his/her statements, conclusions or results. Formulates one or more conjectures that are not appropriate or are unrelated to the situation.

MATHEMATICS

Competency 3: Communicates by using mathematical language

At the end of each year of Secondary Cycle Two, the teacher must prepare competency reports by determining the competency levels attained by the students. Throughout the cycle, the teacher presents students with a variety of situations that enable them to demonstrate their competency in communicating by using mathematical language, in accordance with the requirements of the Québec Education Program.

Because the same scales apply to the three options as well as to the three years in Cycle Two, it is important that teachers propose situations that respect the parameters presented under the heading *Development of the Competency*. These parameters serve to develop, adapt or modify learning and evaluation situations or to adjust their complexity, and are associated with the students' awareness of the ways in which they approach their work, with the contexts and the conditions under which the work is carried out and with the resources required. This section describes the spirit that characterizes each option and gives a synopsis of the elements of the learning content that could be incorporated into the situations involving communication.

Communicates by using mathematical language

5

Advanced competency development

Interprets a mathematical message, taking into account all the important elements. Extracts all relevant data after processing the given information. Uses the mathematical concepts and processes most appropriate to the subject of the message to be interpreted or produced. Precisely conveys the elements of the message as needed by using the most efficient register(s) of semiotic representation. Produces a complete and sound mathematical message consisting of precise arguments. Takes into account the audience and the purpose of the message in an efficient manner. Uses the elements of mathematical language and everyday language to convey a message efficiently or to express his/her ideas clearly and precisely. Rigorously observes the rules and conventions of mathematical language.

4

Thorough competency development

Interprets a mathematical message, taking into account most of the important elements. Extracts most of the relevant data after processing the given information. Uses mathematical concepts and processes appropriate to the subject of the message to be interpreted or produced. Conveys most of the required elements of the message by using the appropriate register(s) of semiotic representation. Produces a mathematical message consisting of an appropriate set of organized arguments. Takes into account the audience and the purpose of the message in an appropriate manner. Uses most of the elements of mathematical language and everyday language appropriately when conveying a message or expressing his/her ideas. Observes the rules and conventions of mathematical language despite some minor errors or inaccuracies.

3

Acceptable competency development

Interprets a mathematical message, taking into account some of the important elements. Extracts some relevant data after processing the given information. Uses some mathematical concepts and processes appropriate to the subject of the message to be interpreted or produced. Conveys some required elements of the message by using the appropriate register(s) of semiotic representation. Produces a mathematical message that is not very well organized but that consists of some appropriate or basic arguments. Takes into account the audience and the purpose of the message, but sometimes has difficulty doing so. Uses some elements of mathematical language and everyday language appropriately when conveying a mathematical message or expressing his/her ideas. Makes some errors related to the rules and conventions of mathematical language.

2

Partial competency development

Interprets a mathematical message, taking few of the important elements into account. Extracts little relevant data after processing the given information. Uses few mathematical concepts and processes appropriate to the subject of the message to be interpreted or produced. Conveys few required elements of the message by using one or more registers of semiotic representation. Produces a confusing mathematical message consisting of mostly inappropriate arguments. Takes little account of the audience or the purpose of the message. Uses the elements of mathematical language and everyday language in a less than appropriate manner when conveying a message or expressing his/her ideas. Makes several errors related to the rules and conventions of mathematical language.

1

Minimal competency development

Interprets a mathematical message, taking into account unimportant elements related to the context. Extracts irrelevant data after processing the given information. Uses mathematical concepts and processes that are not appropriate or related to the subject of the message to be interpreted or produced. Conveys required elements of the message inappropriately by using one or more registers of semiotic representation. Produces a mathematical message consisting of inappropriate arguments or arguments unrelated to the situation. Uses elements of mathematical language and everyday language inappropriately when conveying a message or expressing his/her ideas. Shows little or no concern for the rules and conventions of mathematical language.

