COMPULSORY EXAMINATION
Elementary Cycle Three
Information Document - June 2015
Mathematics
Elementary 6
522-610
Ministère de l'Éducation, du Loisir et du Sport, 2014

ISSN 1927-839X (Online)

Legal Deposit – Bibliothèque et Archives nationales du Québec, 2014

This document is available on the Web site of the Ministère de l'Éducation, du Loisir et du Sport.
TABLE OF CONTENTS

Introduction ................................................................................................................................... 4

1. Organization of the Compulsory Examination .......................................................................... 5

2. Content of the Compulsory Examination .................................................................................. 5

3. Procedure for Administering the Compulsory Examination ...................................................... 6
   3.1 Situational problem ........................................................................................................ 6
   3.2 Situations involving applications ....................................................................................... 7
   3.3. Question Booklet: Mastery of mathematical concepts and processes ....................... 7
   3.4 Measures adapting the conditions for administering ministerial examinations ............. 7

4. Correcting the Compulsory Examination .................................................................................. 7

5. Marking Scales ......................................................................................................................... 8

6. Determining the Student's Results on the Compulsory Examination ................................... 9

7. Using the Compulsory Examination Results .......................................................................... 10

8. Distribution of Materials to Teachers ...................................................................................... 10

Appendix I Example of a Timetable for Administering the Compulsory Examination ............. 11

Appendix II Rubric for the Competency To solve a situational problem related to mathematics ......................................................................................................................... 12

Appendix III Rubric for the Competency To reason using mathematical concepts and processes ......................................................................................................................... 13
INTRODUCTION

The compulsory mathematics examination at the end of Elementary Cycle Three reflects the aims of the Québec Education Program (QEP) and was implemented as part of an effort to make adjustments to the education system in light of student results at the end of elementary school.

This examination is based on the Framework for the Evaluation of Learning, the Progression of Learning and the Québec Education Program. Information gathered on examinations administered in previous years is also taken into account.

In addition, the Ministère de l’Éducation, du Loisir et du Sport (MELS) has encouraged the participation of the school system by inviting teachers and education consultants from different schools to contribute to the development and validation of these examinations.

The results of this mathematics examination will give teachers some indication of the extent to which students have developed the competencies To solve a situational problem related to mathematics and To reason using mathematical concepts and processes.
1. ORGANIZATION OF THE COMPULSORY EXAMINATION

The compulsory mathematics examination is divided into three sections. The first section involves a situation intended to evaluate the competency *To solve a situational problem related to mathematics*. The second section consists of six situations involving applications that are intended to evaluate the competency *To reason using mathematical concepts and processes*. The third section, found in a document entitled Question Booklet, consists of 19 questions intended to evaluate the students’ grasp of mathematical concepts and processes. Part A of this Question Booklet contains a single question comprising four statements. Part B of the Question Booklet consists of 18 questions. **All three sections of the examination are compulsory.**

For the June 2015 examination, MELS provides the following documents for students:

- **For the first section of the examination:**
  - a Reference Document containing the description of the situational problem
  - a Student Booklet, in which students record all their work

- **For the second section of the examination:**
  - six booklets, each containing a different situation involving applications and in which students show all their work

- **For the third section of the examination:**
  - a Question Booklet, divided into two parts and in which students record their answer for each question

For teachers, MELS provides an Administration and Marking Guide.

2. CONTENT OF THE COMPULSORY EXAMINATION

The situational problem must meet all the following conditions:

- The procedure required to solve the situational problem is not immediately clear, since it involves choosing a significant number of concepts and processes covered in the mathematics program and using them in a new way.

- The situation focuses on obstacles to be overcome, which leads to a process of inquiry involving the use of various strategies (strategies for understanding, organizing, solving, validating and communicating).

- The instructions do not suggest a procedure to be followed or the essential knowledge to be used.

The six situations involving applications draw upon a variety of contexts. The concepts and processes involved relate to the branches of mathematics covered in the program, namely, arithmetic (i.e. natural numbers, decimals, fractions), geometry, measurement, statistics and probability.

These situations should enable the students to do the following:

- Choose and apply the required mathematical concepts and processes and present a procedure that clearly demonstrates their reasoning.

- Justify a statement, check a result or procedure, take a position, provide a critical assessment or convince others, using mathematical arguments.
The Question Booklet contains questions that will help teachers evaluate the students' knowledge and understanding of mathematical concepts and processes as well as their ability to apply combinations of acquired mathematical concepts and processes.

The question in Part A of the Question Booklet is read aloud by the teacher. Part B of the Question Booklet consists of multiple-choice questions and short-answer questions.

3. PROCEDURE FOR ADMINISTERING THE COMPULSORY EXAMINATION

Students will have approximately one and a half hours to complete the performance phase of the situational problem. Students may be given an additional 30 minutes if they have almost finished solving the situational problem.

Students will have about 20 minutes to complete the performance phase of each situation involving applications. Students may be given an additional 10 minutes if they have almost finished solving the situation involving applications.

Students will have approximately 60 minutes to complete the Question Booklet. They may be given an additional 15 minutes if they have almost finished answering the questions in the Question Booklet.

It is recommended that schools administer this compulsory mathematics examination over a maximum of four or five days. Appendix I of this document provides an example of a timetable that can be used to administer the compulsory examination. Instructions regarding the administration procedure are provided in the examination’s Administration and Marking Guide.

During the examination, students are strictly forbidden to have in their possession any electronic device (portable media player, smartphone, etc.) that can be used to surf the Internet, translate texts, create or save data, and send or receive information and messages.

3.1 Situational problem

The situational problem can be solved in one day. The phases (preparation, performance and integration) can be broken up by recess or the lunch hour.

A context is provided in order to interest and motivate the students and help them draw upon their prior knowledge or experience related to the situation. The context can be adapted to take into account the specific characteristics of the class.

The students must work alone and submit their work on an individual basis.

The teacher presents the Reference Document and the Student Booklet. If necessary, he/she may clarify or explain a non-mathematical word or expression for one or more students. He/she rereads the Reference Document with the students before the performance phase begins. Furthermore, in this section of the examination, students are permitted to use materials such as a calculator, a dictionary, a glossary or a memory aid they will have prepared beforehand. The Administration and Marking Guide provides tips for the preparation phase and information about the materials that students are permitted to use.
3.2 Situations involving applications

For each situation involving applications, the teacher reads the description of the situation with the students before the performance phase begins. If necessary, he/she may clarify or explain a non-mathematical word or expression for one or more students. The Administration and Marking Guide provides tips for the preparation phase and information about the materials that students are permitted to use. The situation can be adapted to take into account the specific characteristics of the class.

3.3 Question Booklet: Mastery of mathematical concepts and processes

The teacher presents the two parts of the Question Booklet. If necessary, he/she may clarify or explain a non-mathematical word or expression for one or more students. The Administration and Marking Guide provides tips for the preparation phase and information about the materials that students are permitted to use to complete each part of the Question Booklet.

Visual aids (blackboard, transparencies, interactive whiteboard, etc.) may be used to administer Part A of the Question Booklet. The Administration and Marking Guide provides information in this regard.

3.4 Measures adapting the conditions for administering ministerial examinations

Measures that adapt the conditions for administering ministerial examinations may be taken to enable students with specific needs to demonstrate their learning. For further information on the implementation of these measures, please refer to the documents made available to schools by the Direction de la sanction des études.

4. CORRECTING THE COMPULSORY EXAMINATION

School boards and private schools are responsible for marking this examination. However, teachers should agree on how to mark the situational problem and the situations involving applications to ensure a common understanding of the related requirements.

Students’ work is analyzed using the rubrics for each competency, which are found in Appendices II and III. The five performance levels in these rubrics (A, B, C, D and E), which are presented as brief descriptions, make it possible to evaluate student work according to the criteria indicated.

Additional information related to the specific requirements associated with the evaluation criteria is presented under the heading Marking Guidelines in the Administration and Marking Guide. Two types of information are provided:

- observable elements that make up an appropriate solution or line of reasoning

- examples of partially correct work corresponding to the different performance levels for each evaluation criterion; these examples are taken from students’ examination papers obtained during the field-testing process

An answer key is used to mark the work in the Question Booklet.
5. **MARKING SCALES**

The results for the different sections of the compulsory examination will be expressed as numerical marks. The result for the first two sections of the examination will be determined based on a weighting of the evaluation criteria.

The evaluation criteria used for the situational problem are weighted as follows:

<table>
<thead>
<tr>
<th>To solve a situational problem related to mathematics</th>
<th>Observable indicators corresponding to level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evaluation criteria</td>
<td>A</td>
</tr>
<tr>
<td>Indication (oral or written) that the situational problem has been understood</td>
<td>40</td>
</tr>
<tr>
<td>Correct application of the concepts and processes required to produce an appropriate solution</td>
<td>40</td>
</tr>
<tr>
<td>Explanation (oral or written) of the main aspects of the solution</td>
<td>20</td>
</tr>
</tbody>
</table>

For the situations involving applications, the weighting of the evaluation criteria will vary according to the purpose of the task.

For tasks in which students must choose and apply the required mathematical concepts and processes and present clear and organized work that shows what they did or how they did it, the evaluation criteria are weighted as follows:

<table>
<thead>
<tr>
<th>To reason using mathematical concepts and processes</th>
<th>Observable indicators corresponding to level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evaluation criteria</td>
<td>A</td>
</tr>
<tr>
<td>Appropriate analysis of a situation involving applications</td>
<td>30</td>
</tr>
<tr>
<td>Appropriate application of the required processes</td>
<td>50</td>
</tr>
<tr>
<td>Correct justification of actions or statements by referring to mathematical concepts and processes</td>
<td>20</td>
</tr>
</tbody>
</table>

/100
For tasks in which students must use mathematical arguments in justifying a statement, taking a position, providing a critical assessment or convincing others, the evaluation criteria are weighted as follows:

<table>
<thead>
<tr>
<th>To reason using mathematical concepts and processes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evaluation criteria</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Observable indicators corresponding to level</td>
</tr>
<tr>
<td>A</td>
</tr>
<tr>
<td>30</td>
</tr>
<tr>
<td>40</td>
</tr>
<tr>
<td>30</td>
</tr>
</tbody>
</table>

6. DETERMINING THE STUDENT'S RESULTS ON THE COMPULSORY EXAMINATION

The competency To solve a situational problem related to mathematics

In the first section of the examination, the result for the competency To solve a situational problem related to mathematics is expressed as a mark out of 100.

The competency To reason using mathematical concepts and processes

The preliminary result for the second section of the examination is calculated by adding up the results obtained for the six situations involving applications. The final result for this section of the examination, expressed as a mark out of 60, is calculated by dividing the preliminary result by 10 and rounding it off to the nearest unit.

The total result for the Question Booklet is expressed as a mark out of 40. Each of the four statements in Question 1 is worth 1 mark. Questions 2 to 19 are worth 2 marks each. The result obtained in the third section of the examination consists of the sum of the results obtained for the 19 questions in the Question Booklet.

The final result for the competency To reason using mathematical concepts and processes, expressed as a mark out of 100, is calculated by adding up the results obtained for the second and third sections of the examination.
7. USING THE COMPULSORY EXAMINATION RESULTS

This compulsory examination is worth 20% of the student's final mark. The subject mark is obtained by combining the results for each competency according to the weighting of the competencies indicated in the Framework for the Evaluation of Learning.

8. DISTRIBUTION OF MATERIALS TO TEACHERS

At least two weeks before the examination, those responsible for evaluation in each school must provide the teachers concerned with a copy of all the documents in the examination package so that they will have time to read them.

It is recommended that teachers work together to become familiar with the proposed examination procedure so as to develop a common understanding of the examination.
Example of a Timetable for Administering the Compulsory Examination

The chart below presents a possible timetable for administering the examination over a five-day period. It will take students approximately one and a half hours to complete the performance phase of the situational problem and about 20 minutes to complete each situation involving applications. Students will have 60 minutes to complete the Question Booklet.

<table>
<thead>
<tr>
<th>Suggestion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day 1   Administer two situations involving applications.</td>
</tr>
<tr>
<td>Day 2   Administer the preparation and performance phases of the situational problem.</td>
</tr>
<tr>
<td>Day 3   Administer Parts A and B of the Question Booklet.</td>
</tr>
<tr>
<td>Day 4   Administer two situations involving applications.</td>
</tr>
<tr>
<td>Day 5   Administer two situations involving applications.</td>
</tr>
</tbody>
</table>
### RUBRIC FOR THE COMPETENCY

**To solve a situational problem related to mathematics**

**ELEMENTARY CYCLES TWO AND THREE**

<table>
<thead>
<tr>
<th>EVALUATION CRITERIA</th>
<th>LEVEL A</th>
<th>LEVEL B</th>
<th>LEVEL C</th>
<th>LEVEL D</th>
<th>LEVEL E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indication (oral or written) that the situational problem has been understood</td>
<td>In solving the situational problem, the student . . .</td>
<td>In solving the situational problem, the student . . .</td>
<td>In solving the situational problem, the student . . .</td>
<td>In solving the situational problem, the student . . .</td>
<td>In solving the situational problem, the student . . .</td>
</tr>
<tr>
<td>• carries out all the steps</td>
<td>• carries out the main steps</td>
<td>• carries out the main steps</td>
<td>• carries out some of the steps</td>
<td>• begins certain steps, but does not complete them</td>
<td></td>
</tr>
<tr>
<td>• takes the relevant information and all the constraints into account</td>
<td>• takes the relevant information and most of the constraints into account</td>
<td>• takes the main relevant information and some of the constraints into account</td>
<td>• takes some of the relevant information and few of the constraints into account</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• may need minor assistance to clarify some aspects of the situational problem</td>
<td>• may need assistance to clarify some aspects of the situational problem</td>
<td>• needs assistance to clarify several aspects of the situational problem</td>
<td>• needs assistance to clarify most aspects of the situational problem</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• may need minor assistance to clarify some aspects of the situational problem</td>
<td>• needs assistance to clarify all the aspects of the situational problem</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Correct application of the concepts and processes required to produce an appropriate solution</td>
<td>• uses the required mathematical concepts and processes</td>
<td>• uses most of the required mathematical concepts and processes</td>
<td>• uses the most important mathematical concepts and processes required</td>
<td>• uses some of the required mathematical concepts and processes</td>
<td>• uses inappropriate mathematical concepts and processes</td>
</tr>
<tr>
<td>• presents a correct solution or makes only a few minor mistakes</td>
<td>• presents a solution that contains some minor mistakes or only a few conceptual or procedural errors</td>
<td>• presents a solution that contains some conceptual or procedural errors</td>
<td>• presents an incomplete procedure that contains conceptual or procedural errors</td>
<td>• presents an inappropriate or largely inappropriate procedure that includes several conceptual or procedural errors</td>
<td></td>
</tr>
<tr>
<td>• presents a solution consisting of clear and complete work</td>
<td>• presents a solution consisting of clear work, even though some steps are implicit</td>
<td>• presents a solution consisting of incomplete or unclear elements</td>
<td>• shows work consisting of confusing and isolated elements</td>
<td>• shows little work</td>
<td></td>
</tr>
<tr>
<td>• validates the main steps in his/her solution and rectifies it, if necessary</td>
<td>• validates some of the steps in his/her solution and rectifies it, if necessary</td>
<td>• makes sure he/she has completed the main steps in the situational problem and validates certain operations</td>
<td>• makes very little effort to review his/her work</td>
<td>• makes no effort to review his/her work</td>
<td></td>
</tr>
<tr>
<td>Appropriate explanation (oral or written) of how the solution was validated*</td>
<td>• validates the main steps in his/her solution and rectifies it, if necessary</td>
<td>• validates some of the steps in his/her solution and rectifies it, if necessary</td>
<td>• makes sure he/she has completed the main steps in the situational problem and validates certain operations</td>
<td>• makes very little effort to review his/her work</td>
<td>• makes no effort to review his/her work</td>
</tr>
</tbody>
</table>

* The student may be provided with feedback on this criterion, but the criterion must not be considered when determining the student’s mark.
# APPENDIX III

## RUBRIC FOR THE COMPETENCY

*To reason using mathematical concepts and processes*

**ELEMENTARY CYCLES TWO AND THREE**

### OBSERVABLE INDICATORS

<table>
<thead>
<tr>
<th>EVALUATION CRITERIA</th>
<th>LEVEL A</th>
<th>LEVEL B</th>
<th>LEVEL C</th>
<th>LEVEL D</th>
<th>LEVEL E</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Appropriate analysis of a situation involving applications</strong></td>
<td>Identifies all the elements and actions that allow him/her to meet the requirements of the situation</td>
<td>Identifies most of the elements and all actions that allow him/her to meet the requirements of the situation</td>
<td>Identifies the elements and actions that allow him/her to meet the main requirements of the situation</td>
<td>Identifies elements and actions that allow him/her to partially meet some of the requirements of the situation</td>
<td>Identifies elements and actions that have little or no connection to the requirements of the situation</td>
</tr>
<tr>
<td></td>
<td>Chooses the mathematical concepts and processes that allow him/her to meet the requirements of the situation efficiently</td>
<td>Chooses the mathematical concepts and processes that allow him/her to meet the requirements of the situation appropriately</td>
<td>Chooses the mathematical concepts and processes that allow him/her to meet the main requirements of the situation</td>
<td>Chooses mathematical concepts and processes that allow him/her to partially meet some of the requirements of the situation</td>
<td>Chooses mathematical concepts and processes that have little or no connection to the requirements of the situation</td>
</tr>
<tr>
<td><strong>Appropriate application of the required processes</strong></td>
<td>Applies the required concepts and processes appropriately in order to meet the requirements of the task and makes no mistakes in doing so</td>
<td>Applies the required concepts and processes appropriately in order to meet the requirements of the task, but makes a few minor mistakes</td>
<td>Applies some of the required concepts and processes, but makes one conceptual or procedural error,* or makes several minor mistakes</td>
<td>Applies some of the required concepts and processes, but makes one conceptual or procedural error* regarding a key concept associated with the task</td>
<td>Applies concepts and processes, but makes several conceptual or procedural errors,* or applies inappropriate concepts and processes</td>
</tr>
<tr>
<td><strong>Correct justification of actions or statements by referring to mathematical concepts and processes</strong></td>
<td>Presents a clear and complete line of reasoning even though some of its elements are implicit</td>
<td>Presents a line of reasoning consisting of incomplete or unclear elements</td>
<td>Presents a line of reasoning consisting of isolated and confusing elements</td>
<td>Presents a line of reasoning consisting of isolated and confusing elements</td>
<td>Presents a line of reasoning that has little or no connection to the situation, or does not show any work</td>
</tr>
<tr>
<td></td>
<td>Uses rigorous mathematical arguments when required to support his/her actions, conclusions or results</td>
<td>Uses appropriate mathematical arguments when required to support his/her actions, conclusions or results</td>
<td>Uses insufficiently detailed mathematical arguments when required to support his/her actions, conclusions or results</td>
<td>Uses largely inappropriate mathematical arguments when required to support his/her actions, conclusions or results</td>
<td>Uses mathematical arguments that are erroneous or unrelated to the requirements of the situation</td>
</tr>
</tbody>
</table>

* Students who omit a concept or process are considered to have made a conceptual or procedural error.