



# Framework for the Evaluation of Learning

## Mathematics

### Secondary School Cycles One and Two

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# Framework for the Evaluation of Learning

## Introduction

Following the announcement of new orientations regarding the evaluation of student learning by the Minister of Education, Recreation and Sports, the *Basic school regulation for preschool, elementary and secondary education* has been amended to require that, as of July 1, 2011, evaluation be based on the *Framework for the Evaluation of Learning* produced for each program. These frameworks provide guidelines for the evaluation of learning specific to each subject in the Québec Education Program in order to determine students' results, which will be communicated in the provincial report card.

## The role of knowledge in evaluation

Knowledge is at the heart of student learning, since it provides the foundation for all school subjects. Knowledge gives students the means to reflect and to understand the world around them, and its acquisition is the first step in any learning process. Through the knowledge they acquire and through the connections they are able to make among different items of knowledge, students can develop an understanding of simple and complex concepts. Knowledge must therefore be acquired, understood, applied and used thoroughly. Evaluation must thus take place throughout the learning process to ensure proficient knowledge.

## Organization of the evaluation frameworks

For each subject, the framework defines the criteria on which the student's results must be based. These evaluation criteria are based on the ones in the Québec Education Program.

The framework stipulates the weighting of the competencies that makes it possible to determine the subject marks to be recorded in the report card. Where applicable, it provides direct links to the *Progression of Learning* documents that give additional information on the learning specific to each subject in the Québec Education Program.

## The teacher's role in evaluation

Section 19 of the *Education Act* stipulates that teachers are entitled "to select the means of evaluating the progress of students so as to examine and assess continually and periodically the needs and achievement of objectives of every student entrusted to [their] care." It is therefore up to teachers to choose the means of evaluating student learning.



**This arrow** indicates that the evaluation of learning involves a process of going back and forth between the acquisition of subject-specific knowledge and the understanding, application and use of this knowledge. Evaluation must thus take place throughout the learning process to ensure proficient knowledge.

Knowledge will be evaluated at specific times chosen by the teacher, who will determine the importance of the various dimensions to be evaluated in calculating the student's mark.

### Solves a situational problem

30%

#### Evaluation of Learning

##### Evaluation criteria<sup>1</sup>



- |  |  |
|--|--|
| <ul style="list-style-type: none"> <li>■ Proficiency of subject-specific knowledge targeted in the <i>Progression of Learning</i>: ♦             <ul style="list-style-type: none"> <li>■ Arithmetic</li> <li>■ Algebra</li> <li>■ Probability</li> <li>■ Statistics</li> <li>■ Geometry</li> <li>■ Analytic Geometry</li> <li>■ Discrete Mathematics</li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li>■ Indication (oral or written) that the situational problem has been understood</li> <li>■ Application of appropriate mathematical knowledge</li> <li>■ Development of an appropriate solution</li> <li>■ Appropriate validation of the steps in the solution*</li> </ul> |
|--|--|



\* The student must be provided with feedback on this element, but the element must not be considered when determining the student's mark in the report card.

♦ The proficiency of subject-specific knowledge is evaluated as part of *Uses mathematical reasoning*.

### Uses mathematical reasoning

70%

#### Evaluation of Learning

##### Evaluation criteria<sup>2</sup>



- |  |  |
|--|--|
| <ul style="list-style-type: none"> <li>■ Proficiency of subject-specific knowledge<sup>3</sup> targeted in the <i>Progression of Learning</i>:             <ul style="list-style-type: none"> <li>■ Arithmetic</li> <li>■ Algebra</li> <li>■ Probability</li> <li>■ Statistics</li> <li>■ Geometry</li> <li>■ Analytic Geometry</li> <li>■ Discrete Mathematics</li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li>■ Formulation of a conjecture suited to the situation</li> <li>■ Correct use of appropriate mathematical concepts and processes</li> <li>■ Proper implementation of mathematical reasoning suited to the situation</li> <li>■ Proper organization of the steps in an appropriate procedure</li> <li>■ Correct justification of the steps in an appropriate procedure</li> </ul> |
|--|--|



## Communicates by using mathematical language\*

### Evaluation of Learning

Evaluation criteria <sup>4</sup>	
	
<ul style="list-style-type: none"> <li>■ Proficiency of subject-specific knowledge targeted in the <i>Progression of Learning</i>: ♦                             <ul style="list-style-type: none"> <li>■ Arithmetic</li> <li>■ Algebra</li> <li>■ Probability</li> <li>■ Statistics</li> <li>■ Geometry</li> <li>■ Analytic Geometry</li> <li>■ Discrete Mathematics</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>■ Correct interpretation of a mathematical message</li> <li>■ Production of a message in keeping with the terminology, rules and conventions of mathematics, and suited to the context</li> </ul>
	
<p>* The student must be provided with feedback on this element, but the element must not be considered when determining the student's mark in the report card.</p> <p>♦ The proficiency of subject-specific knowledge is evaluated as part of <i>Uses mathematical reasoning</i>.</p>	

## Appendix 1

### Information Clarifying the Criteria

<b>Indication (oral or written) that the situational problem has been understood</b>	<ul style="list-style-type: none"> <li>■ Planning of steps involved in the situational problem</li> <li>■ Identification of relevant information</li> <li>■ Consideration of the constraints of the situational problem</li> </ul>
<b>Application of appropriate mathematical knowledge</b>	<ul style="list-style-type: none"> <li>■ Selection of the required mathematical concepts and processes</li> <li>■ Production of a solution (application of mathematical concepts and processes)</li> </ul>
<b>Development of an appropriate solution</b>	<ul style="list-style-type: none"> <li>■ Clear, thorough indication of how the solution is worked out (procedure and result)</li> </ul>
<b>Appropriate validation of the steps in the solution*</b>	<ul style="list-style-type: none"> <li>■ Validation of the solution</li> </ul>

\* The student must be provided with feedback on this element, but the element must not be considered when determining the student's mark in the report card.

## Appendix 2

### Information Clarifying the Criteria

<b>Formulation of a conjecture suited to the situation</b>	<ul style="list-style-type: none"> <li>■ Formulation of a conjecture based on:               <ul style="list-style-type: none"> <li>■ analysis of the situation</li> <li>■ examples taking into account aspects of the situation</li> </ul> </li> </ul>
<b>Correct use of appropriate mathematical concepts and processes</b>	<ul style="list-style-type: none"> <li>■ Application of the required mathematical concepts and processes</li> </ul>
<b>Proper implementation of mathematical reasoning suited to the situation</b>	<ul style="list-style-type: none"> <li>■ Identification of important aspects of the situation</li> <li>■ Use of appropriate strategies</li> <li>■ Selection of the required mathematical concepts and processes</li> <li>■ Formulation of appropriate working hypotheses and assumptions</li> </ul>
<b>Proper organization of the steps in an appropriate procedure</b>	<ul style="list-style-type: none"> <li>■ Clear, thorough indication of reasoning</li> <li>■ Observance of rules and conventions of mathematical language</li> </ul>
<b>Correct justification of the steps in an appropriate procedure</b>	<ul style="list-style-type: none"> <li>■ Use of rigorous mathematical arguments, when needed, to explain steps, conclusions or results</li> </ul>

## Appendix 3

### Information Clarifying the Criteria

<b>Correct interpretation of a mathematical message*</b>	<ul style="list-style-type: none"> <li>■ Identification of the important elements of a message</li> <li>■ Identification of relevant information</li> <li>■ Selection of relevant mathematical concepts and processes</li> <li>■ Appropriate translation of elements of a message using one or more types (registers) of representation</li> </ul>
<b>Production of a message in keeping with the terminology, rules and conventions of mathematics, and suited to the context*</b>	<ul style="list-style-type: none"> <li>■ Production of an appropriate message consisting of relevant ideas</li> <li>■ Use of relevant mathematical concepts and processes</li> <li>■ Appropriate translation of elements using one or more types (registers) of representation</li> <li>■ Formulation of appropriate mathematical arguments</li> <li>■ Appropriate use of mathematical language and everyday language</li> <li>■ Observance of rules and conventions of mathematical language</li> </ul>
<p>* The student must be provided with feedback on this element, but the element must not be considered when determining the student's mark in the report card.</p>	

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1. The elements under the criterion related to the proficiency of subject-specific knowledge can be found in the *Progression of Learning*. Information clarifying the other criteria is presented in Appendix 1 of this document.
  2. The elements under the criterion related to the proficiency of subject-specific knowledge can be found in the *Progression of Learning*. Information clarifying the other criteria is presented in Appendix 2 of this document.
  3. This criterion corresponds to *Mastery of mathematical concepts and processes*, a criterion in the previous version of the evaluation framework for secondary-level Mathematics.
  4. The elements under the criterion related to the proficiency of subject-specific knowledge can be found in the *Progression of Learning*. Information clarifying the other criteria is presented in Appendix 3 of this document.