

*Definition of the domain
for summative evaluation*

BLG-5064-2

Biology Secondary V

The Anatomy and Physiology of Cells

Reach for
your **Dreams**

Québec 

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for summative evaluation*

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Biology Secondary V

The Anatomy and Physiology of Cells

Formation professionnelle et technique
et formation continue

Direction de la formation générale
des adultes

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1. Introduction

This definition of the domain for summative evaluation describes and classifies the essential and representative elements of the *Biology* program—specifically, for the course *The Anatomy and Physiology of Cells*. 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 all the instruments for summative evaluation are consistent with the overall program.

This definition of the domain is organized in the same way as it is in other courses. The content of each section is, however, specific to this course.

The definition of the domain for summative evaluation is used to prepare examinations that are valid from one version to another, from year to year, 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 Consequences for Summative Evaluation

Orientations

The purpose of this program is to help students acquire knowledge of human anatomy and physiology.

The purpose of this program is to help students understand how the human body functions.

Consequences

Evaluation will test the students' knowledge of anatomical and physiological concepts related to the cell, the basic unit of life.

Evaluation will test the students' understanding of the function of cells and their relationships with the human respiratory, digestive and reproductive systems.

3. Course Content for Purposes of Summative Evaluation

Themes

- **Anatomy of Cells**

- Description of plant and animal cells:
 - name of components
 - description of components
 - role of components
 - diagram
- Comparison of plant and animal cells

- **Physiology of Cells**

- Passive absorption:
 - diffusion
 - osmosis
- Active absorption:
 - phagocytosis
 - active transport
- Illustration of osmosis and active transport
- Mitotic cell division
- Meiotic cell division
- Distinction between the functions of mitosis and meiosis
- Cellular respiration
- Glycolysis, Krebs cycle and the respiratory chain
- Structure of chromosomes
- DNA duplication
- Molecular structure of RNA
- Transcription of DNA coded language into RNA and protein synthesis
- Biological code and transmission of hereditary traits

Skills

- **Describing:** Observing, identifying or recalling the characteristics of a phenomenon or the components of a system.
- **Explaining:** Showing in a structured way the nature and interaction of complex relationships between objects or phenomena.

4. Table of Dimensions

Themes Skills	Anatomy of Cells 20%	Physiology of Cells 80%
Describing 50%	Description of plant and animal cells: - name of components - description of components - role of components - diagram (1) 15%	Mitotic cell division (10%) Meiotic cell division (10%) Glycolysis, Krebs cycle and respiratory chain (10%) Structure of chromosomes (5%) (3) 35%
Explaining 50%	Comparison of plant and animal cells (2) 5%	Passive absorption (5%) Active absorption (5%) Illustration of osmosis and active transport (5%) Distinction between mitosis and meiosis (5%) Cellular respiration (5%) DNA duplication (5%) Molecular structure of RNA (5%) Transcription of DNA coded language into RNA and protein synthesis (5%) Biological code and transmission of hereditary traits (5%) (4) 45%

5. Observable Behaviours

Dimension 1

- Name the structures indicated on a diagram of a plant or animal cell and associate each of these structures with roles and descriptive elements appearing on a list. (The list should contain more roles and descriptive elements than are required.) (15%)

Dimension 2

- Given a series of statements, choose those that accurately compare plant and animal cell composition. Correct false statements to make them valid. (5%)

Dimension 3

- Associate phases of mitotic division with diagrams and statements describing these phases or their characteristics. (10%)
- Associate phases of meiotic division with diagrams and statements describing these phases or their characteristics. (10%)
- Given a series of statements, choose those that correctly associate glycolysis, the Krebs cycle and the respiratory chain with cellular respiration or the release of energy required by an organism. Correct false statements to make them valid. (A diagram of cellular respiration is provided.) (10%)
- Given a series of statements, choose those that correctly describe the structure of a chromosome. Correct false statements to make them valid. (5%)

Dimension 4

- Given a series of statements, choose those that correctly explain passive absorption through the cell membrane. Correct false statements to make them valid. (5%)
- Given a series of statements, choose those that correctly explain active absorption through the cell membrane. Correct false statements to make them valid. (5%)
- Given a concrete example of osmosis or active transport, explain the phenomena observed. (5%)
- Given a series of statements, choose those that adequately compare the functions of mitosis and meiosis. Correct false statements to make them valid. (5%)

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- Given a series of statements, choose those that correctly explain the process of cellular respiration and that correctly associate it with the digestive and respiratory systems. Correct false statements to make them valid. (5%)
- Complete a diagram of a DNA strand that is duplicating and explain the process. (5%)
- Explain the composition and structure of an RNA strand. (5%)
- Complete a diagram illustrating the transcription of information from DNA to RNA and explain the process. (5%)
- Explain the relationship between DNA, RNA, the synthesis of proteins and the transmission of a given genetic trait. (5%)

6. Explanation of Content and Weighting

In establishing the relative importance of the themes *Anatomy* and *Physiology*, greater weight has been assigned to understanding cellular physiology than to memorizing anatomical structures.

The relative importance of each skill to be developed has been determined by adding up the weightings given to the observable behaviours pertaining to that skill.

On the basis of the tasks prescribed by the terminal objectives of the program, the weighting of the themes and skills has been established as follows:

Dimensions related to the theme <i>Anatomy</i>	20%
Dimensions related to the theme <i>Physiology</i>	80%
Dimensions related to the skill <i>Describing</i>	50%
Dimensions related to the skill <i>Explaining</i>	50%

7. Description of the Examination

A. Type of Examination

The summative examination is a written examination administered at the end of the course. It is designed to measure all of the dimensions and counts for 100% of the final mark. It consists of structured-response and short-response items.

B. Characteristics of the Examination

The examination is written at the end of the course in a single session lasting no more than 120 minutes.

C. Pass Mark

The pass mark for the entire examination is 60%.

