

LEARNING GUIDE

TRANSFORMATIONS

APPLIED GENETICS

BIOLOGY

BLG-5070-2



IN COMPLIANCE
WITH THE
NEW PROGRAM

SOFAD

LEARNING GUIDE

TRANSFORMATIONS

APPLIED GENETICS

BIOLOGY

BLG-5070-2



SOFAD

Project Management

Alain Pednault

Editorial Support

Marie-Ève Côté

Laëtitia Gagnon

Author

Stéphanie Gervais

Pedagogical and Scientific Consultants

Geneviève Bellerive, Teacher,
Adult General Education, CS
de la Seigneurie-des-Mille-Îles
(CSSMI)

Junior Carrier, Teacher and
Pedagogical Adviser, Adult
General Education, CS Charlevoix

Jessie Trottier-Chabot, Teacher,
Adult General Education, CS de
l'Or et des Bois (CSOB)

Linguistic Review

Julie Drolet

Illustrations

Marc Tellier

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Graphic Design

Mylène Choquette

Layout

Marquis Interscript

English version**Project Management**

Ali K. Mohamed

Translation

Claudia de Fulviis

Proofreading

Barbara Chunn

Scientific Content Revision

Daniel Afriyie
(Mathematics and Science
Teacher, English Montreal
School Board)

Bernard Osei-Asamoah
(Science Consultant, English
Montreal School Board)

Sonya Fiocco
(Educational Consultant,
Lester B. Pearson School Board)

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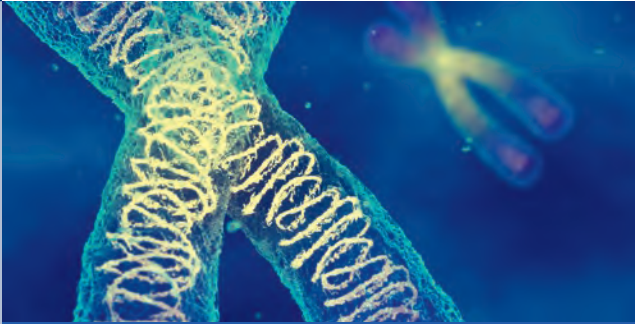
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Legend: L = Left C = Centre R = Right
T = Top B = Bottom

Table of Contents



CHAPTER 1

The Mechanisms of Heredity

Heredity: At the Heart of Evolution

SITUATION 1.1

HEREDITY **TRAITS** **CHROMOSOMES** **ALLELE**

LS 1.1 – A Family Resemblance	4
Exploration	5
Acquisition	6
Solution	16
Consolidation	19

SITUATION 1.2

PHENOTYPE

LS 1.2 – Scattered Files	20
Exploration	21
Acquisition	22
Solution	30
Consolidation	33

KNOWLEDGE SUMMARY	36
--------------------------------	----

INTEGRATION	38
--------------------------	----

LES	40
------------------	----



CHAPTER 2

The Laws of Heredity

May the Strongest Win!

SITUATION 2.1

MENDEL'S LAWS (LAW OF DOMINANCE, LAW OF SEGREGATION, LAW OF INDEPENDENT ASSORTMENT)

LS 2.1 – A Strange Flower	44
Exploration	45
Acquisition	46
Solution	58
Consolidation	60

SITUATION 2.2

GENETIC CROSSES (AUTOSOMAL INHERITANCE, SEX-LINKED INHERITANCE)

LS 2.2 – Interesting Proportions	62
Exploration	63
Acquisition A	64
Solution	78
Acquisition B	80
Consolidation	84

KNOWLEDGE SUMMARY	86
--------------------------------	----

INTEGRATION	87
--------------------------	----

LES	90
------------------	----



CHAPTER 3

DNA and Genes

DNA: The Language of the Book of Life

SITUATION 3.1 PRACTICAL ACTIVITY

GENOME **DNA REPLICATION** **GENE** **PROTEIN SYNTHESIS**

LS 3.1 – A Criminal Investigation	94
Exploration	95
Acquisition	96
Solution	106
Consolidation	110

SITUATION 3.2

GENETIC CODE **GENE MUTATION** **HEREDITARY DISEASE**

LS 3.2 – A Strange Mutation	112
Exploration	113
Acquisition	114
Solution	126
Consolidation	129

KNOWLEDGE SUMMARY	133
--------------------------------	-----

INTEGRATION	134
--------------------------	-----

LES	136
------------------	-----



CHAPTER 4

Evolution

Species Transformation

SITUATION 4.1

BIOLOGICAL EVOLUTION **GENETIC DIVERSITY** **GENE POOL**

MECHANISMS OF MICROEVOLUTION

LS 4.1 – Taking the Bull by the Horns	140
Exploration	141
Acquisition	142
Solution	152
Consolidation	156

SITUATION 4.2

ADAPTATION **INTERVENTIONS MODIFYING THE GENETICS OF A SPECIES**

LS 4.2 – Harmful Hybrids	158
Exploration	159
Acquisition	160
Solution	164
Consolidation	166

KNOWLEDGE SUMMARY	167
--------------------------------	-----

INTEGRATION	168
--------------------------	-----

LES	170
------------------	-----



CHAPTER 5

Genetic Engineering Manipulating Life

SITUATION 5.1

GENETIC TRANSFORMATION (GENETICALLY MODIFIED ORGANISMS [GMOs])

GENE MANIPULATION TOOLS

LS 5.1 – To the Rescue of Diabetics	174
Exploration	175
Acquisition	176
Solution	182
Consolidation	185

SITUATION 5.2 PRACTICAL ACTIVITY

DNA SEQUENCING (CLONING, TRANSGENESIS)

GENETIC ENGINEERING APPLICATIONS (CLONING, TRANSGENESIS)

LS 5.2 – Are You for or Against Cloning?	186
Exploration	187
Acquisition	188
Solution	198
Consolidation	200

KNOWLEDGE SUMMARY	201
-------------------------	-----

INTEGRATION	202
-------------------	-----

LES	204
-----------	-----

COMPLEMENTARY RESOURCES

SELF-EVALUATION	207
-----------------------	-----

GLOSSARY	221
----------------	-----

ANSWER KEY	227
------------------	-----

COMPETENCY EVALUATION GRIDS	257
--------------------------------------	-----

PRACTICAL ACTIVITIES	259
----------------------------	-----

Introduction to the Learning Guide

Welcome to the learning guide for the *Applied Genetics* course. The goal of this **Secondary V Biology** course is to develop your ability to seek answers to problems related to the molecular functioning of cells and to genetics, genetic diversity and the genetic process of evolution. In this course, you will:

- process data to solve problems related to genetic crossing, calculate the probability of hereditary diseases and interpret DNA tests;
- apply your knowledge to illustrate the effects of a mutation in a cell's DNA sequence, understand the presence of a genetic disease or explain a species' ability to adapt to a change in its environment;
- make informed decisions on social, ethical and environmental issues arising from the use of technologies in molecular biology and evaluate their impact on society and demographics;
- use various methods to communicate your ideas and the results of your scientific research on applied genetics.

Listed below are the three competences you will develop:

- Seeks answers or solutions to problems involving biology.
- Makes the most of his/her knowledge of biology.
- Communicates ideas relating to questions involving biology, using the languages associated with science and technology.

You are now invited to carry out the learning activities presented in the five chapters of this learning guide.

Portailsofad.com

You can find all the material you need to accompany the TRANSFORMATIONS series on portailsofad.com: videos and printable versions of complementary resources.



CHAPTER COMPONENTS

The learning process followed in each chapter is illustrated below. The pedagogical intent is specified for each section. Learners progress by building on what they have learned from one section to the next.

CHAPTER INTRODUCTION

The first page describes the context and the theme that will serve as a backdrop for the acquisition of the new knowledge discussed in the chapter.

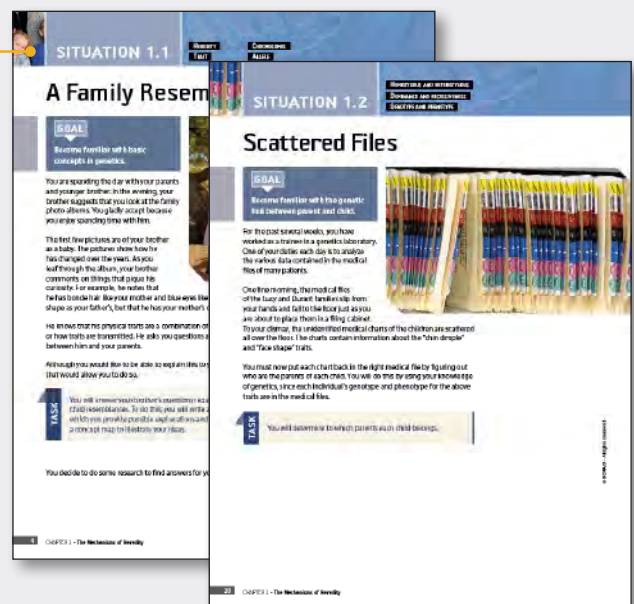


A table of contents accompanies this first page. The knowledge to be acquired is described for each of the *Situations*, as well as the theme of the situational problems.

SITUATIONS

In general, each chapter contains two *Learning Situations*, which can be either theoretical or practical.

The approach taken in these situations enables learners to acquire new knowledge and develop skills in realistic and meaningful contexts.



PHASES OF EACH SITUATION



SITUATIONAL PROBLEM

Related to the main theme of the chapter, this page briefly describes the context of the situational problem and provides the information needed to solve it.

A box describes the task that you must perform later in the *Solution* section. This task is the starting point for acquiring new knowledge to solve the situational problem.



EXPLORATION

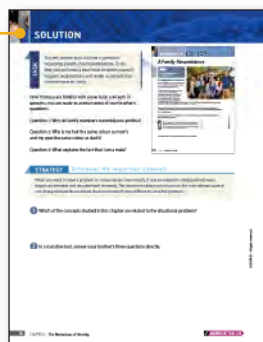
This section invites you to analyze the data of a situational problem, and then identify the knowledge you possess and the knowledge you need to acquire in order to perform the task.

Aspects of the investigative process in science and exploration strategies may also be suggested here.



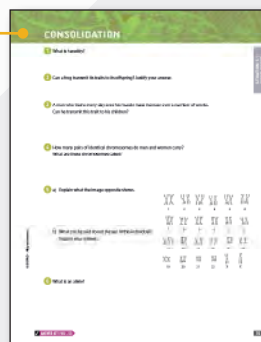
ACQUISITION

This is where the knowledge needed to solve the situational problem is assimilated.



SOLUTION

When you reach this section, you should have acquired all the knowledge and strategies that are essential to solving the situational problem described at the beginning of the situation. Other elements of the investigative process in science and analysis strategies may also be suggested here.



CONSOLIDATION

This section allows you to consolidate the knowledge you acquired in *Acquisition*.

Like *Integration*, *Consolidation* contributes to competency development.

AT THE END OF A CHAPTER . . .

KNOWLEDGE SUMMARY

This section summarizes all the knowledge to *Remember* that was presented in the chapter.

INTEGRATION

In this section, which includes exercises and complex situations, you are expected to apply the knowledge you acquired in this chapter.

LES

The *LES* is a complex task developed according to the certification evaluation model. It is accompanied by a competency evaluation grid, found at the end of the learning guide.

COMPLEMENTARY RESOURCES



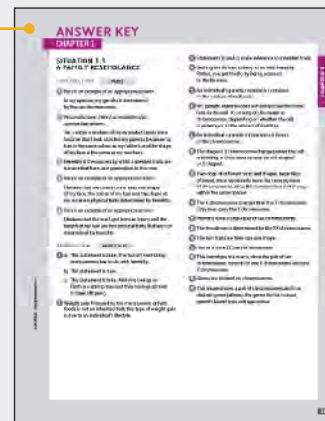
SELF-EVALUATION

Presented in the first part of *Complementary Resources*, the *Self-Evaluation* activities allow you to evaluate your acquired knowledge and the competencies you have developed throughout the course. This is a chance for you to determine whether you need to review the material before you complete the *Summary Scored Activity*.



GLOSSARY

Key concepts **bolded blue** and terms **bolded black** in the body of the guide are defined in the *Glossary*.



ANSWER KEY

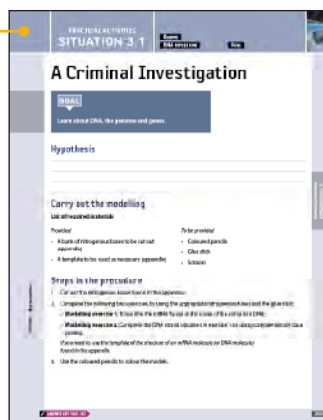
The *Answer Key* allows you to check your answers and complements the learning process.

This section contains the answers to questions and detailed explanations of the approach to be taken or the reasoning to be used.



COMPETENCY EVALUATION GRID

After solving a *LES*, you are asked to evaluate yourself using this grid. You may then complete the concise version of this grid at the end of each *LES*.



PRACTICAL ACTIVITIES

Practical activities 3.1 and 5.2 are found in this section of the guide. They are also available on portallsofad.com.



APPENDIX

This section contains additional information.

HEADINGS

TASK

You will calculate the results of the cross between Louis and Isabelle for the characteristics ...

Presents the task to be performed as part of the situational problem.

REMINDER

DNA stands for deoxyribonucleic acid. This acid is composed of two complementary chains of nucleotides that form a double helix. This acid is formed by two chains of ...

Refers to knowledge acquired in previous courses and related refresher exercises.

REMEMBER

A **DNA molecule** consists of two strands that wind around each other like a twisted ladder ...

Presents the knowledge to be mastered, as prescribed by the program of study.

INVESTIGATIVE PROCESS

B...

The first step in the investigative process is to define the problem ...

Presents aspects of the investigative process in science that can be applied to a variety of situations.

STRATEGY *Consider...*

When an investigative process involves forming an opinion or ...

Presents exploration or analysis strategies that can be applied to a variety of situations.

DID YOU KNOW?

Discovery of the helical structure of DNA
In 1953, the geneticist ...

Allows you to discover historical and cultural information related to the concepts being studied.

NOTE

The ribonucleic acid (RNA) molecule acts as a messenger between DNA ...

Provides additional information or points out possible exceptions to the concept in question.



PRACTICAL ACTIVITY BOOKLET

Now complete the Hypothesis section in the ...

Prompts you to complete a section in the practical activity booklet.



These icons refer to Web resources (links or videoclips) available on portailsofad.com.

SCORED ACTIVITY

You must now do Scored Activity 1. It is available on the course website ...

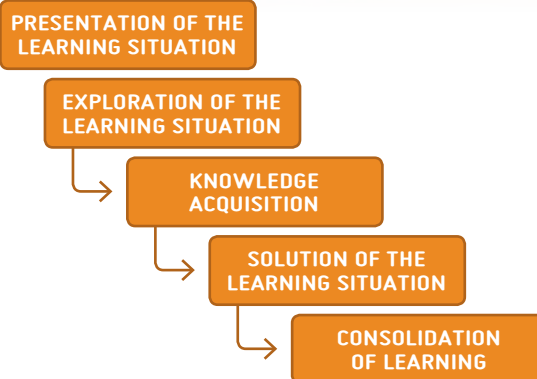
Indicates that you are now ready for the *Scored Activity*, which will test your understanding of the material covered so far. At the very end of the course you will complete a *Summary Scored Activity*.

These activities are presented in separate booklets. Once completed, you must submit them to your teacher (or tutor), who will mark them and provide feedback.

The **TRANSFORMATIONS** collection consists of all the courses in the Diversified Basic Education Program for Secondary IV and Secondary V.



The courses in the **TRANSFORMATIONS** collection feature a learning process based on the acquisition of prescribed knowledge through interesting and meaningful learning situations. The instructional approach underlying this learning process is outlined below:



The knowledge and competencies to be developed become meaningful through investigations that require learners to use inductive and deductive reasoning skills. The learning guides provide a variety of simple exercises and more complex tasks that address the needs of both learners and teachers. Additional resources are available on Sofad's e-learning portal.

Components of the **TRANSFORMATIONS** collection:

- Experimental (or Practical) Activity Booklet: Print and PDF versions
- Toolkit: Print and PDF versions
- Learning Guide: Print and PDF versions
- Teaching Guide (PDF)
- Video clips of concepts and laboratory techniques
- Kits of materials for the experimental and practical activities
- Scored activities
- Answer keys

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