LEARNING GUIDE

TRANSFORMATIONS

CLIMATE CHANGE

SCIENCE AND TECHNOLOGY

TSC-4062-2

IN COMPLIANCE WITH THE NEW PROGRAM

SOFAD

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TRANSFORMATIONS

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Original French Version

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About this Learning Guide

Welcome to the learning guide for the *Climate Change* course. This Secondary IV course in the Science and Technology program is intended to develop your ability to deal with situations relating to key climate change issues, such as:

- disruptions in the carbon cycle and the increase in the greenhouse effect caused by human activities;
- acidification of the oceans;
- the melting of the glaciers leading to flooding;
- increased frequency of droughts and extreme climate events;
- disturbances in terrestrial and aquatic biomes, which affect various animal and plant species.

A better understanding of these issues will enable you to take action to reduce your carbon footprint and raise public awareness of climate change as part of a project you will carry out.

You will develop the following three competencies:

- Seeks answers or solutions to scientific or technological problems;
- Makes the most of his/her knowledge of science and technology;
- Communicates in the languages used in science and technology.

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

Portailsofad.com

Video capsules and printable versions of complementary resources for this guide and the TRANSFORMATIONS collection are available on the **portailsofad** website.

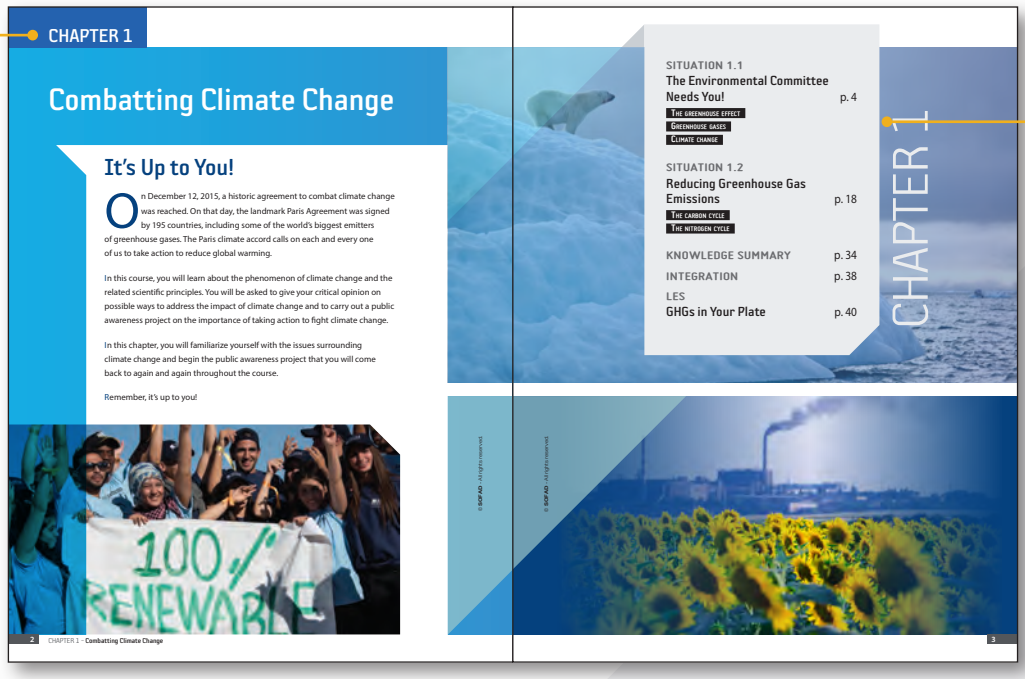
They will be useful throughout this course.

CHAPTER ORGANIZATION

The learning process presented in each chapter allows you to make progress by building on what you learned in the previous sections. The following diagram illustrates this process and states the educational aim of each section.

INTRODUCTION

The first page describes the context and the theme that will provide the basis for learning the new concepts introduced in the chapter.



A table of contents opposite the first page presents the knowledge to be acquired in the two learning situations and the theme of each one.

SITUATIONS

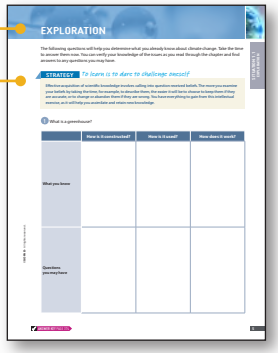
There are two learning situations in each chapter: one is theoretical and the other is practical, in the form of an experiment. The learning process in both situations allows you to acquire new concepts and develop competencies within real-life, meaningful contexts.

PARTS OF A LEARNING SITUATION

PRESENTATION OF THE LEARNING SITUATION

This page sets out the main theme of the chapter, briefly describes the context of the learning situation, and provides the information needed to complete the task.

A text box describes the task to be carried out later on, in the *Resolution* section. This task is the starting point for acquiring the new knowledge that will enable you to complete it.



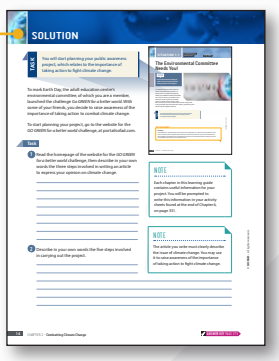
EXPLORATION

In this section you will analyze the information provided in the learning situation and identify what you already know about the topic at hand, as well as the new knowledge you will need to complete the task.

Different aspects of the investigative process in science and exploration strategies are suggested here.

ACQUISITION

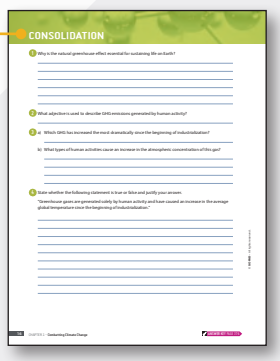
In this section, you will acquire the knowledge required to complete the task.



SOLUTION

When you get to this section, you should have all the knowledge you need to complete the task described at the beginning of the chapter.

Additional elements of the investigative process in science and exploration strategies are suggested here.



CONSOLIDATION

This section allows you to put into practice the knowledge covered in *Acquisition A* and *Acquisition B*. Like the *Integration* exercises, the *Consolidation* exercises also help you to develop the competencies.

AT THE END OF EACH CHAPTER

KNOWLEDGE SUMMARY

This section summarizes all the key concepts presented in the chapter.

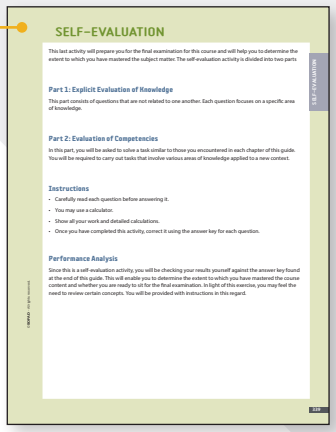
INTEGRATION

This section includes complex exercises and scenarios that require you to apply what you have learned in the chapter.

LES

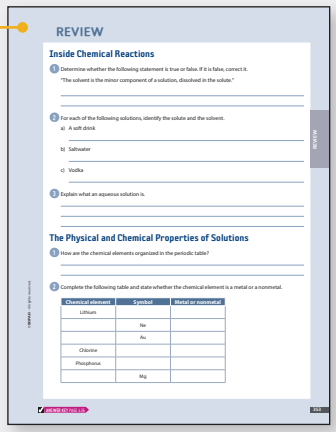
The learning and evaluation situation (*LES*) is a complex task similar to those that you will encounter in the final exam. It includes a rubric for the comptencies (competency evaluation chart).

ADDITIONAL MATERIALS



SELF-EVALUATION

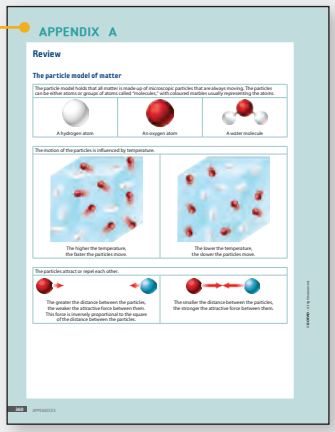
A *Self-evaluation* activity is found in the first part of the *Additional Materials* section. It is used to evaluate the knowledge you have acquired and the competencies you have developed during the course. It also helps you determine the knowledge you have mastered and the concepts you must review before doing the *Scored Synthesis Activity*.



REVIEW

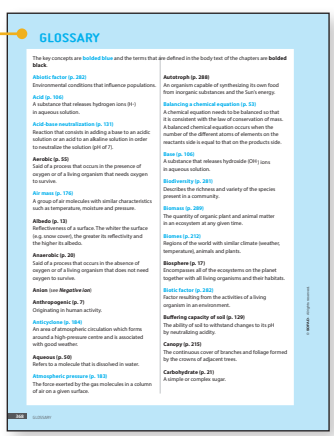
While working through the *Situation* sections, you will come across *Reminder* text boxes containing knowledge that you covered in previous courses and that you will need to understand new concepts or complete the task.

The *Review* section consists of questions that will help you to review the concepts appearing in the *Reminder* boxes.



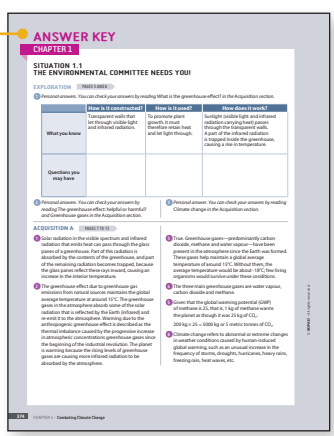
APPENDICES

In this section, you will find additional information such as abbreviations and units of measure.



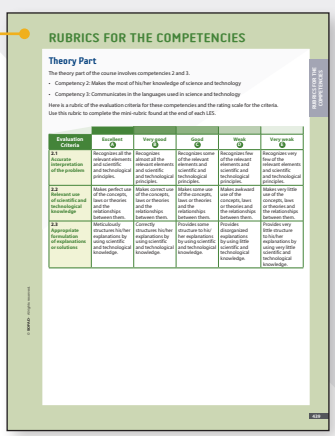
GLOSSARY

Key concepts **bolded blue** and terms **bolded black** in the body text of the chapters also appear in the *Glossary*.



ANSWER KEY

The *Answer Key* at the end of the guide will allow you to check your answers and steer you through the learning process. It contains the answers to the questions in the guide and detailed explanations regarding the correct procedure or line of reasoning to be used.



RUBRICS FOR THE COMPETENCIES

There are *Rubrics for the Competencies* at the end of the guide. After completing a learning and evaluation situation, or *LES*, you can use these rubrics to evaluate your work. You can then complete the abbreviated rubric found at the end of each *LES*.

HEADINGS

TASK

You will start planning your awareness-raising project.

Presents the task to be carried out as part of the learning situation.

REMINDER

The composition of air

Pure air is a mixture …

Refers to knowledge acquired in previous courses and to review exercises related to this *Reminder*.

KEY KNOWLEDGE

The **greenhouse effect** is an increase in the atmospheric temperature …

Presents new key concepts to be learned. This knowledge is prescribed by the program of studies.

INVESTIGATIVE PROCESS *B…*

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

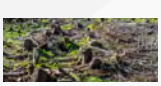
Presents aspects of the investigative process in science that can be applied in various situations.

STRATEGY *Consider…*

When an investigative strategy involves forming an opinion …

Presents exploratory or analytical strategies that can be applied in various situations.

DID YOU KNOW?



Deforestation is responsible for 18% of GHG emissions worldwide …

Encourages you to discover additional scientific, historical and cultural information related to the concepts being studied.

TIP

To remember the charge of an anion, …

Gives a tip that makes the task simpler, or suggests a different approach to dealing with the problem or applying the concept in question.

NOTE

Electron transfer makes it possible for ionic bonds to form between a metal …

Gives additional information or points out exceptions that can apply to the concept in question.

TOOLKIT

See technique for collecting …

Refers to the information found in the **Toolkit**.

LABORATORY REPORT

Read the **goal** of the experiment and the steps in the **experimental procedure** …

Refers to information to be completed in the Experimental Activity Booklet.

Refers to Web resources (sites and videos) suggested on **portailsofad.com**.

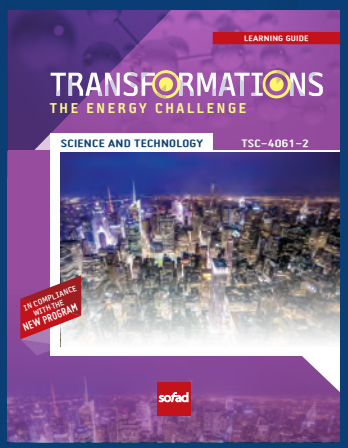
SCORED ACTIVITY

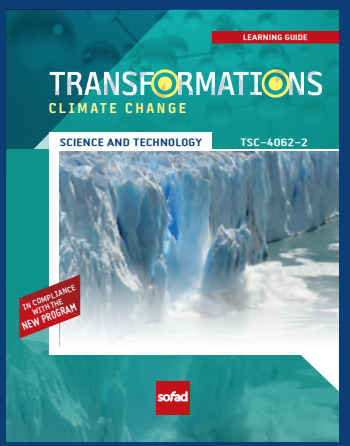
You must now do Scored Activity 1. It is available on the course website . . .

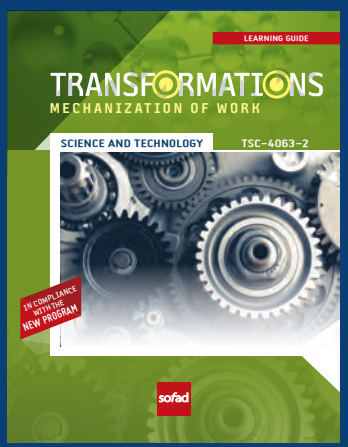
Indicates that you are now ready to do the *Scored Activity* that will test your understanding of what you have learned. The *Scored Synthesis Activity* is done at the very end of the course.

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

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

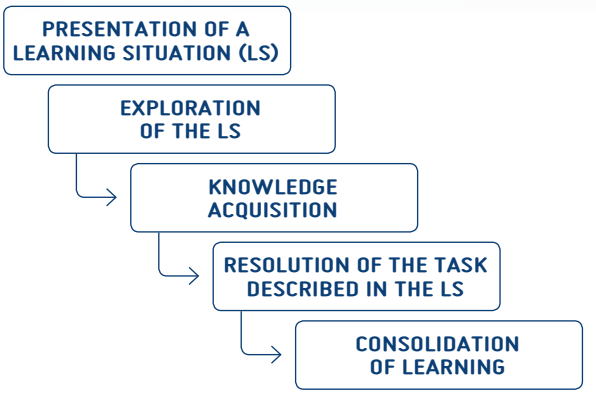






SOFAD

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 portailsofad.com.

Components of the TRANSFORMATIONS collection:

- Toolkit: Print and PDF versions;
- Learning Guide: Print and PDF versions;
- Teaching Guide: PDF;
- Video clips of concepts and laboratory techniques;
- Experiment kits;
- Scored activities;
- Answer keys.

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